THE COMMONWEALTH OF MASSACHUSETTS

BOARD OF FIRE PREVENTION REGULATIONS

527 CMR 1.00 - 50.00
FIRE CODE

FIRE CODE DATED June 06
FIRECODE
100396
$23.60

Published by;

William Francis Galvin
Secretary of the Commonwealth

effective **7/11/2008**

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1.01: General

(1) Title. 527 CMR as set forth herein shall be known as the Massachusetts Comprehensive Fire Safety Code.

(2) Purpose. The purpose and the intent of 527 CMR is to prescribe minimum requirements and controls to safeguard life, property and public welfare from the hazards of fire and explosion created by the storage, handling or use of substances, materials or devices or from conditions hazardous to life, property and the public welfare.

(3) Alternate Methods and Materials. The provisions of 527 CMR are not intended to prevent the use of any material or method of work not specifically prescribed by 527 CMR, provided such alternative has been approved by the head of the fire department. The approval of any such alternative shall comply with the intent of the provisions of 527 CMR. The material, method or work offered shall be at least the equivalent of that prescribed in 527 CMR in quality, strength, effectiveness, fire resistance, durability and safety. The provisions of 527 CMR 1.01(3) shall not apply to 527 CMR 12.00, as the jurisdiction having authority is the inspector of wires appointed pursuant to M.G.L. c. 166, § 32.

Said alternate approval shall be allowed only when the head of the fire department is provided with such sufficient proof as he may require.

The head of the fire department shall keep a record of each application accompanied by such evidence, letters, statements, results of tests or other supporting documentation used to justify such request. A copy of the approval of the head of the fire department shall be provided to the applicant and kept on file by the head of said fire department.

1.02: Applicability

(1) New and Existing Conditions. The provisions of 527 CMR and the standards listed in 527 CMR 49.00 shall apply equally to new and existing buildings and conditions.

Exceptions:

1. Existing conditions which do not constitute a distinct hazard to life or property.
2. The transportation of any articles or substance under the jurisdiction of and in compliance with the regulations prescribed by the military forces of the United States.

(2) Applicability of Other Laws. Nothing in 527 CMR shall be construed, interpreted or applied to abrogate, nullify or abolish any law, ordinance or code adopted by the jurisdiction governing the construction, alteration, addition, repair, removal, demolition, use, location, occupancy and maintenance of buildings specifically provided herein. When any provision of 527 CMR is found to be in conflict with any building, zoning, safety, health or other applicable law, ordinance or code of the jurisdiction existing on the effective date of 527 CMR or hereafter adopted, the provision which establishes the higher standard for the promotion and protection of the safety and welfare of the public shall prevail.

(3) Application of Building Code. The planning, design and construction of new buildings and structures to provide egress facilities, fire protection, and built-in fire protection equipment shall be in accordance with 780 CMR; and any alterations, additions or changes in buildings required by the provisions of 527 CMR which are within the scope of 780 CMR shall be made in accordance therewith.

1.02: continued

(4) Special Equipment. Special fire protection equipment shall be installed when adequate fire protection is not being provided or hazardous or dangerous conditions exist, as determined by the head of the fire department. The special fire protection equipment shall be installed in accordance with the requirements of 527 CMR and 780 CMR.

(5) Existing buildings: Buildings built under and in full compliance with the codes in force at the time of construction or alteration thereof, and that have been properly maintained and used for such use as originally permitted, shall be exempt from the requirements of 527 CMR pertaining to any of the following matters:

(a) Fire protection of structural elements except as provided for existing buildings under 780 CMR.

(b) Exits required, except as provided for existing buildings under 527 CMR and 780 CMR.

(c) Isolation of hazardous operations and mixed uses; provided, however, that the head of the fire department shall require the installation of fire safety devices or systems (fire extinguishers, fire alarms, fire detection devices, sprinklers or similar systems) where they are necessary to provide safety to life and property. In lieu of requiring the installation of safety devices or systems or when necessary to secure safety in addition thereto, the head of the fire department shall prescribe limitations on the handling and storage of materials or substances or upon operations that are liable to cause fire, contribute to the spread of fire, or endanger life or property.

1.03: Enforcement Authority

(1) Enforcement Official. It shall be the duty and responsibility of the Marshal or the head of the fire department or his designee, to enforce the provisions of the code as herein set forth.

(2) Coordinated Inspections. Whenever in the enforcement of 527 CMR, another code, ordinance or by-law is the responsibility of more than one code official of the jurisdiction is involved, it shall be their duty to coordinate their inspections and administrative orders as fully as practicable so that the owners and occupants of the building or structure shall not be subjected to visits by numerous inspectors nor multiple or conflicting orders. Whenever an inspector from any agency or department observes an apparent or actual violation of some provision of some law, ordinance, code or by-law of the jurisdiction, not within the inspector's authority to enforce, the inspector shall report the findings to the code official having jurisdiction.

(3) Right of Entry. The marshal, an inspector, the head of the fire department, or any person to whom the marshal or the head of the fire department may delegate the authority, may, in the performance of the duties imposed by M.G.L. c. 148, or in the furtherance of the purpose of any provision of any law, ordinance or by-law relating to the subject matter of M.G.L. c. 148 or of any rule or regulation contained in 527 CMR, or any order of the marshal or head of the fire department, enter any reasonable hour any building or other premises, or any ship or vessel, to make an inspection or investigation, without being held or deemed to be guilty or trespass. (M.G.L. c. 148, § 4.)

(4) Investigation of Fires. The head of the fire department shall investigate the cause and circumstances of every fire or explosion to determine if such fire was caused by carelessness or design. The investigation shall be made forthwith if it appears to the official making such investigation that the fire or explosion is of suspicious origin or is the result of a violation of law or, if he is unable to determine the cause, he shall immediately notify the marshal. All other fires shall be reported in writing to the marshal within 48 hours, excluding Sundays and holidays on forms furnished by the department. (M.G.L. c. 148, § 2).

(5) Fire Records. The head of the fire department shall keep a record of all fires or explosions, with the results of such investigations, and such records shall be open to the public.

(6) Certificates, Licenses and Permits Issued by the Marshal.

(a) It shall be the duty of the Marshal, or his designee, to issue certain approvals, licenses certificates, licenses or permits required by 527 CMR 2.00, 9.00, 13.00, 22.00, 24.00 or any

1.03: continued

other provision of 527 CMR or the provisions of M.G.L. c. 148. The marshal may suspend or revoke without a hearing any approval, license, certificate or approval issued under 527 CMR whenever the holder thereof has committed a violation of any law, ordinance or by-law relating to the subject matter of M.G.L. c. 148, or any provision of 527 CMR, the nature of which would give the marshal reason to believe that the continuing operation by such holder is and will be so seriously improper as to constitute an immediate threat to the public safety. Upon such suspension or revocation, the marshal shall forthwith send written notice thereof to the holder. Such notice shall specify the time and place of the violation. The marshal, or any person to whom he has delegated his authority, may order the license, permit or certificate of such holder to be delivered to him; and the license, permit or certificate shall not be reissued unless, upon examination or investigation, or after a hearing, the marshal, or his designee determines that the holder shall again be permitted to operate. Said holder shall be entitled to a hearing within 30 days of the suspension or revocation.
(b) The holder of any approval, license certificate, license or permit issued by the marshal under 527 CMR, shall provide the Marshal with an accurate address and mailing at the time of application and shall report any changes of such address to the Marshal within 14 days of the date of such change.
(c) Any notice sent to a holder of any approval, license certificate, license or permit issued by the marshal under 527 CMR, shall be deemed delivered and received by said holder, if the notification is sent by certified mail, return receipt requested, to the last known address of said holder, according to the records of the Marshal at the time of such mailing.

((7) Jurisdictional Liability: Reserved)

(8) Duties of the Head of the Fire Department. Whenever the maintenance, operation, or use of any land, building, structure, material or other object, or any part thereof, including vehicles used in the transport of hazardous materials constitutes a fire or explosion hazard which is dangerous or unsafe, or a menace to the public safety (including, but not limited to, fires, explosions, hazardous material incidents, motor vehicle accidents, structural collapses, mass casualty incidents and emergency extrication incidents) and the action to be taken to eliminate such dangerous or unsafe condition or conditions which create, or tend to create, the same is not specifically provided for in 527 CMR, and unless otherwise prohibited by law, ordinance, by-law, regulation, the head of the fire department is hereby authorized and empowered to take such action as may be necessary to abate such dangerous or unsafe condition or conditions (directing employees of other city or town departments and agencies) and including the evacuation of buildings and/or the transport or hazardous materials, the speed, routes, amounts, and hours of transport through the city, town or district shall also be regulated.

(9) Fire Protection Devices Neither Designed Nor Capable of Function. The installation or use, in any building, of any device or object that reasonable appears to be a smoke detector, sprinkler head, carbon monoxide alarm, heat detector or any other similar device, used for life safety or fire protection that is, in fact, neither designed nor capable of performing such life safety or fire protection function, shall be prohibited.

1.04: Permits

(1) Enforcement. The head of the fire department shall grant permits as required by 527 CMR or as required by M.G.L. c. 148 and make such inspections as required in M.G.L. c. 148.

(2) Application. Application for a permit required by 527 CMR shall be made on form furnished by the department or as provided by the head of the fire department.

(3) Conditions of Permit. A permit shall constitute permission to maintain, store or handle materials, or to conduct processes which produce conditions hazardous to life or property, or to install equipment used in connection with such activities in accordance with the provisions of 527 CMR. Such permission shall not be construed as authority to violate, cancel or set aside any of the provisions of 527 CMR. Said permit shall remain in effect until revoked, or for such period of time specified on the permit. Permits are not transferable and any change in use, operation or tenancy shall require a new permit.

1.04: continued

(4) Approved Plans. Plans approved by the head of the fire department are approved with the intent they comply in all respects to 527 CMR. Any omissions or errors on the plans do not relieve the applicant of complying with all applicable requirements of 527 CMR.

(5) Revocation of Permit. The head of the fire department may revoke a permit or approval issued under the provisions of 527 CMR if upon inspection any violation of the code exists, or if conditions of a permit have been violated, or if there has been any false statement or misrepresentation as to material fact in the application, data or plans on which the permit or approval was based.

(6) Suspension of Permit. Any permit issued shall become invalid if the authorized work or activity is not commenced within six months after issuance of the permit, or if the authorized work or activity is suspended or abandoned for a period of six months after the time of commencement.

(7) Payment of Fees. A permit shall not be issued until the designated fees have been paid.

(8) Where Required. The head of the fire department or his designee shall have the authority to issue the following permit types, as described in 527 CMR and M.G.L. c. 148.

Permit Type	**Reference**
Blasting	527 CMR 13.04(2), 13.04(11)
Bonfires and Burning Christmas Trees	527 CMR 10.23
Bowling Pin and Lane Refinishing	527 CMR 10.15
Cannon and Mortar Firing	527 CMR 22.03
Cellulose Nitrate Film	527 CMR 10.27
Combustible Fibers	527 CMR 28.03
Compressed Natural Gas (CNG)	527 CMR 26.08
Covered Mall Buildings	527 CMR 10.26
Crop Ripening or Color Processing	527 CMR 35.03
Cutting and Welding	527 CMR 39.04
Dust Explosion Prevention	527 CMR 10.16
Explosives and Black Powder	527 CMR 13.04
Fire Protection Equipment	527 CMR 10.03(15); M.G.L. c. 148, § 27A
Fire Protection System	527 CMR 10.03(15)
Fireworks, Display	527 CMR 2.05; M.G.L. c. 148,§ 39A
Fireworks, Manufacture, Storage and Handling	527 CMR 2.03; M.G.L. c. 148, § 12
Flammable and Combustible Liquids	527 CMR 14.03, 15.04; M.G.L. c. 148. § 23
Flammable Gases and Solids	527 CMR 14.03
Fuel Transfer Operations	527 CMR 5.08
Fumigation and Insecticidal Fogging	527 CMR 10.06
Hazardous Substances, Left Unattended	527 CMR 25.08
Limited Special Effects	527 CMR 2.09
LP-Gas	527 CMR 6.08
Matches	527 CMR 10.18
Oil Burning Equipment	527 CMR 4.03
Open Air Fires	527 CMR 10.22
Ovens and Furnaces	527 CMR 10.19
Rubbish Containers	527 CMR 34.03
Salamanders	527 CMR 20.01
Special Seasonal Decorations	527 CMR 21.02
Storage, Combustible Material	527 CMR 10.03
Tank Vehicles Parked Overnight	527 CMR 8.04, 14.03
Tanks and Containers	527 CMR 9.06, 9.07; M.G.L. c. 148, § 38A
Tar Kettles on Roofs	527 CMR 10.03
Tire Recapping and Rebuilding Plants	527 CMR 10.21

1.04: continued

Permit Type	Reference
Tire Storage	527 CMR 10.03
Torches and Heat Producing Devices	527 CMR 10.24
Transportation of Combustible Liquids	527 CMR 8.04

1.05: Means of Appeal

(1) Appeals to the State Fire Marshal. Any person aggrieved by an act, rule, order or decision of the head of the fire department, or other person or persons acting or purporting to act under the authority derived from M.G.L. c. 148, except § 5, or any rule or regulation made under 527 CMR, may appeal to the marshal. Such appeal shall be filed within ten days following the act, rule, order or decision but only in so far as the appeal presents a direct question of fire or explosion hazard, M.G.L. c. 148, § 31.)

1.06: Orders to Eliminate Dangerous or Hazardous Conditions

(1) Fire Code Violations. Whenever the marshal, the head of the fire department or any person to whom the marshal or head of the fire department has delegated is authority in writing, finds in any building or upon any premises a violation of 527 CMR or any condition likely to cause fire or any obstacle to easy ingress or egress from such building, they shall, in writing, order the same to remedied. Notice of the violation shall be served in accordance with the provisions of M.G.L. c. 148, § 5, including, but not limited to the following:

(a) Dangerous conditions which are liable to cause or contribute to the spread of fire or explosion in or on said premises, building or structure or endanger the occupants thereof;
(b) Conditions which interfere with the efficiency and use of any fire protection equipment;
(c) obstructions to or on fire escapes, stairs, passageways, doors or windows, liable to interfere with the egress of occupants or the operation of the fire department in case of fire;
(d) Accumulations of dust or waste material in air conditioning or ventilating systems or grease in kitchen or other exhaust ducts;
(e) Accumulations of grease on kitchen cooking equipment, or oil, grease or dirt upon, under or around any mechanical equipment;
(f) Accumulations of rubbish, waste, paper, boxes, shavings, or other combustible materials, or excessive storage of any combustible material;
(g) Hazardous conditions arising from defective or improperly used or installed electrical wiring, equipment or appliances;
(h) Hazardous conditions arising from defective or improperly installed equipment for handling or using combustible, explosive or otherwise hazardous materials;
(i) Dangerous or unlawful amounts of combustible, explosive or otherwise hazardous materials;
(j) All equipment, materials, processes or operations which are in violation of the provisions and intent of 527 CMR.
(k) The use of any machine, device or chemical to create a fog, foam or haze-like visual effect which could become an obstacle to ingress or egress from any place of assembly.

(2) Maintenance. The owner, tenant or lessee of every building or structure shall be responsible for the care and maintenance of all fire protection systems, including equipment and devices, to insure that safety and welfare of the occupants. Fire protection systems shall not be disconnected or otherwise rendered unserviceable without first notifying the fire department. Where required fire protection systems are temporarily out-of service for maintenance or repair, the owner, tenant or lessee shall immediately advise the fire department and shall diligently prosecute the restoration of the protection. A fire permit may be required depending on the extent and length of time the system is out-of-service pursuant to M.G.L. c. 148, § 27A. Installation of, or modification to, any automatic fire protection system shall require a permit from the head of the fire department.

(3) Unsafe Buildings. See M.G.L. c. 143 and 780 CMR.

1.06: continued

(4) Evacuation. When, in the opinion of the head of the fire department, there is actual and potential danger to the occupants or those in the proximity of any building, structure or premises because of unsafe structural conditions, or inadequacy of any means of egress, the presence of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases or materials, the head of the fire department shall order the immediate evacuation of said building, structure or premises. All of the occupants so notified shall immediately leave the building, structure or premises and persons shall not enter or re-enter until authorized to do so by the head of the fire department.

(5) Building Code Violations: The head of the fire department or any person designated by him who, in the performance of his official duties, observes any condition which he believes to be a violation of any provision of 780 CMR, shall report the same to the authority charged with the enforcement of such provision. (M.G.L. c. 148, § 28A).

(6) Notification to Other Officials. The fire, building and health officials and other administrative agencies of the jurisdiction to whom the authority is delegated to inspect buildings and structures in respect to the maintenance of safe conditions of use and occupancy shall immediately notify the respective official of any CMR violation promulgated by an agency of the Commonwealth of Massachusetts.

(7) Failure to Correct Violations. If the notice of violation is not complied with in the time specified by the head of the fire department, the head of the fire department may request the legal counsel of the jurisdiction to institute the appropriate legal proceedings to restrain, correct or abate such violation or to require removal or termination of the provisions of 527 CMR or of any order or direction made pursuant thereto.

1.07: Penalties

(1) Violation of Order. Violation of any lawful rule or order of the head of the fire department, punishment whereof is not otherwise provided for, shall be punished by a fine of $50 for each day during which such violation continues after actual notice of regulation, rule, or order (M.G.L. c. 148, § 30).

(2) Violation of Fire Code. Any person who knowingly violates a rule or regulation of 527 CMR, except as otherwise provided, shall be punished by a fine of not less than $100.00, nor more than $1000.00 (M.G.L. c. 148, § 10B).

(3) Violation of Fire Law. Except as otherwise provided, any person violating a provision of M.G.L. c. 148, shall be punished by a fine of $100.00, or, in the case of a continuing offense after notice of such violation, to a fine of not more than $100 for every day which the violation continues (M.G.L. c. 148, § 34).

1.08: Definitions

Unless otherwise expressly stated, the following terms shall, for the purpose of 527 CMR, have the following meanings:

Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural the singular.

Terms Defined in the Other Codes. Where terms are not defined in 527 CMR and are defined in other codes and standards listed in 527 CMR 49.00, they shall have the meanings ascribed to them as in those codes.

Terms not Defined. Where terms are not defined through the methods authorized by 527 CMR, they shall have ordinarily accepted meanings such as the context may imply.

1.09: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 1.00 shall be considered a part of the requirements of 527 CMR 1.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 1.00: M.G.L. c. 22, § 14; c. 148, §§ 9, 10, 28.

NON-TEXT PAGE

527 CMR 2.00 THE MANUFACTURING, STORAGE, TRANSPORTATION AND USE OF FIREWORKS

Section

2.01: Purpose and Scope
2.02: NFPA Standards No. 1123, 1124, and 1126 Incorporated by Reference
2.03: Definitions
2.04: Certificates of Competency and Permits for Supervised Displays of Fireworks
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2.09: Theatrical Special Effects or Pyrotechnic Display Before a Proximate Audience

2.01: Purpose and Scope

(1) The purpose of 527 CMR 2.00 is to provide minimum standards for the safe use of fireworks and special effects by competent operators, and the keeping, manufacturing, storage and intrastate transport of fireworks and pyrotechnic materials.

(2) 527 CMR 2.00 shall apply to supervised displays of fireworks; theatrical special effects, special effects before a proximate audience; the keeping, storage, manufacture, and intrastate transport of fireworks; permitting of fireworks displays; use of special effects; certificates of competency to conduct supervised fireworks displays or special effects; fireworks classified in accordance with the U.S. Department of Transportation (DOT) 49 Code of Federal Regulations (CFR) 173; display fireworks, also known as "1.3G" and "1.4G"; any combustible or explosive composition or substance, or any combination of the same, or any other article which was prepared for the purpose of producing a visible or audible effect by combustion, explosion, deflagration or detonation.

(3) 527 CMR 2.00 shall not apply to the following:
- (a) Explosives regulated by 527 CMR 13.00,
- (b) Model Rocketry regulated by 527 CMR 16.00,
- (c) Cannon or Mortar Firing regulated by 527 CMR 22.00,
- (d) Any of the items expressly prohibited or allowed under M.G.L c. 148, § 39,
- (e) Interstate transportation of fireworks.

2.02: NFPA Standards No.1123, 1124, and 1126 Incorporated by Reference

(1) For the purposes of 527 CMR 2.00 the provisions of NFPA Standards No. 1123, 1995 Edition.; No. 1124, 1995 Edition.; No. 1126, 1996 Edition., are hereby incorporated by reference with the following exceptions:
- (a) Where any conflict occurs between the standards adopted and 527 CMR 2.00, 527 CMR 2.00 shall prevail.
- (b) The following sections of the NFPA 1123 shall not apply:
  1. 5-2.2, - *until 5/1/2000*
  2. 6-1.
- (c) The following sections of NFPA 1126 shall not apply
  1. 4-2.1,
  2. 4-5.

2.03: Definitions

As used in 527 CMR 2.00, the following definitions shall have the meanings respectively assigned to them:

2.03: continued

Aerial Shell. Usually a cylindrical or spherical cartridge containing pyrotechnic material, a long fuse or electrical match wires, and a black powder lift charge. The shells are most commonly three inches (76 mm) to six inches (152mm) outside diameter and are fired from mortars. Upon firing of the shell, the fuse and lift charge are consumed

Airburst. An effect intended to be suspended in the air to simulate outdoor aerial fireworks shells without hazardous debris.

Approved. Approved by the State Fire Marshal.

Assistant. A person who works under the direction of the operator to put on an outdoor fireworks display. The duties of an assistant include tasks such as loading mortars, spotting the bursting location of aerial shells, tending a ready box, the firing of shells both manually and electrically, setting up and cleaning the discharge site.

Audience. Those spectators whose primary purpose is to view a fireworks display.

Authority Having Jurisdiction. The Marshal or head of the fire department.

Barrage. A rapidly fired sequence of aerial fireworks, mortars are loaded prior to the display, and the aerial shells are chain fused to fire in rapid sequence.

Barge. A flat bottomed boat, ship, or vessel used for the bulk transportation of freight or commodities.

Barrier. Material of substantial strength, uniformly supported and providing an uninterrupted barrier both vertically and horizontally and of a height of no less than 40 inches. Such barrier shall clearly define the restricted discharge area behind which the audience shall be located.

Battery. A collection of fireworks devices, such as a group of mortars (finale battery) or a bundle of Roman candles (candle battery), fused together in such a manner that they are fired within a short period of time. This term is not to be confused with an electrical battery used to provide a source of current.

Black Powder. A deflagrating or low explosive compound of an intimate mixture of sulfur, charcoal, and alkali nitrate, usually potassium or sodium nitrate.

Black Match. A fuse made from string that is impregnated with black powder and used for igniting pyrotechnic devices.

Board. The Board of Fire Prevention Regulations established under M.G.L. c. 22, § 14.

Break. An individual burst from an aerial shell, generally either producing a visual effect (stars) or noise (salute). Aerial shells can be either single-break (having only one burst) or multi-break (having two or more bursts).

Certificate of Competency (Fireworks Display). A license granted by the Marshal to an individual which allows this person to be in charge of and responsible for the loading and firing of a Supervised Fireworks Display or Special Effects.

CFR. Code of Federal Regulations.

Chain Fusing. A series of two or more aerial shells fused to fire in sequence from a single ignition. Finales and barrages typically are chain fused.

2.03: continued

Comet. A fireworks device consisting of a pellet of pyrotechnic composition that is ignited and propelled from a mortar tube by a charge of black powder. Comets frequently leave a trail of sparks or fire as they rise in the air, and they sometimes burst into smaller fragments at their zenith.

Competent Operator. The person holding a Certificate of Competency and named on the Permit to Display Fireworks with overall responsibility for the safety, set up, and discharge of an outdoor fireworks display or special effects before a proximate audience.

Discharge Site. The area immediately surrounding the fireworks mortars used for an outdoor fireworks display. For the purposes of 527 CMR 2.00 the discharge site is the direct and proximate location where fireworks are setup, loaded and located for the purpose of conducting a fireworks display. Distances for determining proper placement of launch mortars and shells shall be in accordance with Table 2.08-1.

Display Site. The immediate area where a fireworks display is conducted. This includes the discharge site, the fallout area, and the required separation distance from mortars to spectator viewing areas, vehicle parking areas, and the nearest building.

Dense Pack Portable Firing Trailer (PFT). A trailer with single shot mortars that are securely braced with a metal framework for firing aerial shells electrically, as apprved by the Marshal.

DOT. United States Department of Transportation.

Electrical Firing Unit. A device that provides and controls the electric current used to ignite fireworks during an outdoor display. A firing unit normally has switches to control the routing of the current to the devices to be used during the display and also might contain test circuits and warning indicators. Units can be manual, automatic, or hand-held. All electrical firing units shall be approved by the marshal except for hand held units.
(a) Automatic Electrical Firing Unit. A panel or box that operates automatically to provide the source of electrical current used to ignite electric matches. The unit is attached by wires or cables to junctions that are connected to the electric matches, which, in turn, are attached to fireworks devices. Automatic units often are operated by magnetic tape or by computer.
(b) Hand-Held Electrical firing Unit. A small, hand-held unit with manually operated switches that control the flow of electrical current to electric matches attached to fireworks devices. The unit is connected directly to the electric matches by means of wires.
(c) Manual Electrical Firing Unit. A panel or box with manually operated switches that control the flow of electric current to electric matches attached to fireworks devices. The unit contains wires or cables that are attached to junctions that are, in turn, connected to the electric matches.

Electrical Ignition. A technique used to ignite fireworks using a source of electric current. Typically, electric matches are attached to or inserted into fireworks devices prior to the display and are connected to wires leading back to an electrical firing unit. During the display, the operator controls the ignition of the fireworks using the electrical firing unit.
(a) Electric Match. A device consisting of wires terminating at a relatively high-resistance element surrounded by a small quantity of heat-sensitive pyrotechnic composition. When a sufficient electrical current is passed through the wire circuit, the heat that is generated ignites the pyrotechnic composition, producing a small burst of flame. This flame can be used to ignite a fuse or a lift charge in a fireworks device. For the purposes of 527 CMR 2.00, the term electric match also refers to other similar technologies in which an electrical current is used to produce a high temperature for ignition purposes.
(b) Electric Squibs. Small tubes or blocks containing a small quantity of ignition compound in contact with a wire bridge.

Explosive. As defined by 527 CMR 13.00.

Explosive Material. As defined by 527 CMR 13.00.

2.03: continued

Explosive Composition. Any Chemical compound or mixture the primary or common purpose of which is to function by explosion.

Fallout Area. The area in which any hazardous debris falls after a pyrotechnic device is fired. The fallout area is established by the fallout radius.

Fallout Radius. A line that defines the fallout area of a pyrotechnic device. It is defined by two points. The first point is the center of a pyrotechnic device. The second point is the point most distant from the center of the pyrotechnic device at which any hazardous debris from the device can fall.

Finale. A rapidly fired sequence (barrage) of aerial fireworks, typically fired at the end of a display. The mortars are loaded prior to the display, and the aerial shells are chain fused to fire in rapid sequence.

Fire (v.). To ignite pyrotechnic materials by using a match, electrical current, or some other means.

Fireworks. Any material, composition or device for the purposes of producing a visible or an audible effect for entertainment purposes by combustion, deflagration, or detonation that meets the definition of "Consumer Fireworks" or "Display Fireworks as set forth in 527 CMR 2.00.

Exception No. 1: Model rockets and model rocket motors designed, sold, and used for the purpose of propelling recoverable aero models are not considered to be fireworks. (*See* 527 CMR 16.00, Model Rockets)

(a) Consumer Fireworks. As defined by NFPA 1123.

(b) Display Fireworks. Explosive devices intended for use in outdoor fireworks displays that are presented in conformance with the provisions of 527 CMR 2.08(1). These devices are designed to produce visible or audible effects for entertainment purposes by combustion, deflagration, or detonation. The term "display fireworks," as used in 527 CMR 2.00, includes consumer fireworks to be used in fireworks displays; larger devices of similar construction and chemical composition that are classed as explosives, 1.3G and described as Fireworks, UN0335 by the U.S. Department of Transportation; and other devices that produce visible or audible effects for entertainment purposes that are classed as explosives 1.3G, 1.4G or 1.4s and described as Article, Pyrotechnic by the U.S. Department of Transportation.

(c) Special Effects Fireworks. (Pyrotechnic Fireworks) Explosive devices or articles containing any pyrotechnic composition manufactured and assembled, designed, intended for use discharge in conformance with the provisions of 527 CMR 2.08(2), in connection with television, theater, motion picture productions, or demonstration which may or may not be presented before live audiences, and any other articles containing any pyrotechnic composition used for education, recreation or entertainment purposes which may or may not be presented before a live audience.

(d) Novelties and Trick Noisemakers. Small devices containing limited amounts of pyrotechnic explosive or composition that produce a visible or audible effect.

Exception No.1: Toy caps for use in toy pistols, toy canes or toy guns, and novelties and trick noisemakers as enumerated in Appendix E of NFPA 1123 are not considered to be fireworks.

Fireworks Display. A presentation of fireworks for a public or private gathering.

(a) Fireworks Display Outdoors. Any fireworks display other than a Special Effect or Pyrotechnics Display before a Proximate Audience that is operated and controlled by a Competent Operator.

(b) Fireworks Display Marine. Any display which is discharged from the surface of any waters of the commonwealth and is operated and controlled by a Competent Operator.

2.03: continued

(c) Special Effect or Pyrotechnic Display Before a Proximate Audience. A visible or audible effect for demonstration or entertainment purposes which is operated and controlled by a Competent Operator. Frequently an illusion; that is, something that appears to be other than what it really is. For example, smoke may be created to give an audience the impression of fog being present. Or a puff of smoke, a flash of light, and a loud sound may be produced to give an audience the impression that a cannon has fired, when in reality the cannon has not been fired.

(d) Supervised Display of Fireworks. Any display of fireworks other than a Special Effect or Pyrotechnics Display before a Proximate Audience. Sometimes referred to as a Permitted Display, Outdoor Display, Marine Display or Barge Display, that is operated and controlled by a Competent Operator.

Fireworks User's Certificate, a license granted by the Marshal under the provisions of 527 CMR 2.04(2), which allows a person or firm to use fireworks.

Firing System. The source of ignition for fireworks pyrotechnic special effects devices. For an electrical system, it is the source of the electric current used to ignite electric matches or other devices. Generally, the electrical firing system will have components, such as a primary key switch, test circuits, warning indicators, cables, isolation transformers, and switches to control the routing of the current to various pyrotechnic devices.

(a) Display, Manually Fired. Any display in which multiple shot mortars are reloaded and re-fired by hand-held torch, flare, or similar device.

(b) Display, Remote Electrical. Any display in which single shot mortars containing one shell per display are used and initiated remotely by means of an approved electrical firing board.

Fixed Production. Any production repeatedly performed in only one geographic location.

Flare. A pyrotechnic device designed to produce a single source of intense light for a defined period of time.

Fusee. A highway distress flare, sometimes used to ignite fireworks at outdoor fireworks displays.

Ground Display Piece. A pyrotechnic device that functions on the ground (as opposed to an aerial shell that functions in the air). Typical ground display pieces include fountains, roman candles, wheels, and "set pieces."

Harbor Masters. An individual appointed under the provisions of M.G.L. c. 102, § 19.

Hazardous Debris. Any debris produced or expelled by the functioning of a pyrotechnic device that is capable of causing personal injury or unpredicted property damage. This includes, but is not limited to, hot sparks, heavy casing fragments, unignited components. Confetti, lightweight foam pieces, feathers, novelties, etc. are not to be construed as hazardous debris.

Head of the Fire Department. An individual as defined in M.G.L. c. 148, § 1.

Highway. Any way as defined by M.G.L. c. 90, § 1.

Igniter. An electrical, chemical, or mechanical device normally used to fire pyrotechnics.

Ingredient. A chemical used to create a pyrotechnic material. Such a chemical is not a pyrotechnic by itself.

Intrastate. Commerce within the state, as opposed to commerce between the states (i.e. interstate).

Lance. A thin cardboard tube packed with color-producing pyrotechnic composition used to construct ground display pieces. Lances are mounted on a frame and fused so that ignition of all tubes is nearly simultaneous.

2.03: continued

Lift Charge. That composition in an aerial shell that propels (lifts) the shell into the air when ignited. It usually consists of a black powder charge ignited by a quick match fuse. (A time delay fuse then ignites the main part of the shell, producing the desired effect.)

Magazine. Any building, structure, or container used exclusively for the storage of explosive materials that meets the requirements of 527 CMR 2.07.

Manual Ignition. A technique used to ignite fireworks or special effects mixes using a hand-held ignition source such as a fusee or portfire.

Manufacture. The preparation of fireworks mixes and the loading and assembly of all fireworks.
Exception: The preparation of pyrotechnic devices for immediate use on a display site by qualified personnel who hold a Certificate of Competency (fireworks) where such manufacture is otherwise legal.

Manufacturing Building. Means any building or other structure (except magazines) in which the manufacture of fireworks or any processing involving the manufacture of fireworks material is carried on, and any building where fireworks materials are used as a component part or ingredient in the manufacture of any explosive article or device.

Manufacturer of Fireworks. Any person licensed in accordance with 27 CFR Part 55, and engaged in the business of manufacturing fireworks for the purpose of sale or distribution.
Exception No. 1: In the case of binary systems, the supplier of pre-weighted or pre-measured ingredients, not the person mixing the ingredients, is considered the manufacturer of any pyrotechnic materials created from binary components.
Exception No. 2: The person loading binary materials into devices supplied by the manufacturer of binary systems shall not be considered a manufacturer when such loading is preformed according to the instructions of the manufacturer.
NOTE: A federal manufacturer license is required when a binary system is used and the components are mixed in the course of a trade or business to create an explosive material.

Marshal. The State Fire Marshal as defined in M.G.L. c. 148, § 1.

Massachusetts Requirement. A requirement of 527 CMR 2.00. When specifically stated within 527 CMR 2.00 it is a requirement of 527 CMR 2.00 and shall prevail over the provisions of any adopted standard.

Mine. A device designed to project numerous stars and other effects, such as whistles and firecrackers, into the air from a mortar. A black powder charge ignites the contents of the mine, propelling its contents into the air to altitudes that usually are lower than those reached by aerial shells.

Mortar. A tube or a pot-like device used to direct and control the effect of the pyrotechnic material. Mortars also prevent debris from falling into unsafe areas. Mortars shall be sufficient in strength to withstand the firing of the pyrotechnic device or material without the mortar becoming distorted.
(a) Mortars, Finale. Any single shot mortars which are fired either manually or electrically, normally in a barrage effect at the conclusion of the display.
(b) Mortars, Multiple Shot. Any mortars which are reloaded and refired during a display such as in a manually fired display.
(c) Mortars, Rack Mounted (Flights). Any single shot mortars used during a display which are used to fire a limited number of shells in sequence and which otherwise meet the construction requirements of 527 CMR 2.08(5).
(d) Mortars, Single Shot. Any mortars which are loaded with only one shell and fired only once during a display such as in a remote electrical display.

Mortar Rack. A strong frame containing mortars. Such racks most often are used for barrages and finales and in electrically ignited displays.

2.03: continued

Mortar Trough. Aboveground structures filled with sand or similar material into which mortars are positioned ready for use in a fireworks display. Also referred to as a blast box or volley box.

NFPA. The National Fire Protection Association.

NFPA 70. 527 CMR 12.00.

Operator.

(a) *See* Competent Operator.

(b) Special Effects Operator. (Pyrotechnic Operator) A person who holds a Certificate of Competency (Special Effects) with responsibility for pyrotechnic safety and who controls, initiates, or otherwise creates special effects. The operator is also responsible for storing, setting up, and removing pyrotechnic materials or devices after a performance.

Performer. Any person active in the performance during which a pyrotechnic special effect occurs who is not audience or support personnel. Among others, performers can include, but are not limited to, actors, singers, musicians, acrobats, and the like.

Person. Any natural person, individual, firm, co-partnership, corporation, company, association, or joint-stock association, including any trustee, receiver, assignee, or personal representative thereof.

Permit to Display Fireworks. A permit issued, in writing on forms furnished by the Department of Fire Services, to a Competent Operator by the head of the fire department or the Marshal to conduct a Supervised Fireworks Display or Special Effects before a Proximate Audience.

Proscenium Wall. A fire resistive wall which separates a stage or enclosed platform from the public or spectator area of an auditorium or theater as defined in 780 CMR 6: *Types of Construction* (The State Building Code).

Production. All the performances of a musical, dramatic, operatic, or other series of shows. There are two types of productions: fixed and touring.

Proximate Audience. An audience closer to pyrotechnic devices than allowed by 527 CMR 2.08. Fireworks Display Outdoors.

Public Conveyance. Any railroad car, street car, ferry, cab, bus, airplane, or other vehicle that carries passengers for hire.

Pyrotechnic Composition. A chemical mixture that, upon burning, produces visible, brilliant displays, bright lights, or sounds.

Pyrotechnic Device. Any device containing pyrotechnic materials and capable of producing a special effect.

Pyrotechnic Special Effect. A fireworks special effect created through the use of pyrotechnic materials and devices. *See* Fireworks Display, Fireworks.

Pyrotechnics. The science of controlled exothermic chemical reactions that are timed to create the effects of light, heat, gas, sound, dispersion of aerosols, emission of visible electromagnetic radiation, or a combination of these effects to provide the maximum effect from the least volume.

Pyrotechnical Material (Pyrotechnic Special Effects Material). A chemical mixture used in the entertainment industry to produce visible and or audible effects of combustion, deflagration, or detonation. Such a chemical mixture predominantly consists of solids capable of producing a controlled, self-sustaining, and self-contained exothermic chemical reaction that results in heat, gas, sound, light or a combination of these effects. The chemical reaction functions without external oxygen.

2.03: continued

Quick Match. A black match that is encased in a loose-fitting sheath. While exposed black match burns slowly, quick match propagates flame extremely rapidly, almost instantaneously. Quick match is used in fuses for aerial shells and for simultaneous ignition of a number of pyrotechnic devices, such as lances in a ground display piece.

Railway. Any steam, electric, diesel-electric, or other railroad or railway which has a particular line or branch in the vicinity of a pyrotechnics manufacturing or storage facility, or in the vicinity of an outdoor fireworks display.

Ready Box. A storage container for aerial fireworks such as mines, comets, and shells at the site of a fireworks display.

Rocket. A pyrotechnic device that moves by the ejection of matter produced by the internal combustion of propellants.

Salute. A display fireworks item that is designed to produce a loud report.

Salute Powder. A pyrotechnic composition that makes a loud report when ignited and constitutes the sole pyrotechnic effect of a salute.

Shall. Indicates a mandatory requirement.

Shooter. A member of the fireworks display crew (either the operator or an assistant) who performs the actual ignition of the fireworks, either by manual or electrical means.

Special Effects Fireworks. *See* Fireworks, Display Fireworks.

Sponsor. The organization (person, group, or government agency) that arranges with a duly authorized fireworks supplier for its services in presenting a fireworks display or in providing fireworks for use in a display.

Spotter. A member of the fireworks display crew (either the operator or an assistant) who observes the firing and bursting of aerial shells and other display fireworks for the purpose of detecting proper mortar angling, noting the occurrence of duds, and observing for other potentially hazardous situations.

Stage. A partially enclosed portion of an assembly building or outdoor platform which is designed or used for the presentation of displays, demonstrations, or other entertainment wherein scenery, drops, or other effects may be installed or used, and where the distance between the top of the proscenium opening and the ceiling above the stage is more than five feet.

Stars. Small masses of pyrotechnic compounds that are projected from aerial shells, mines, or roman candles. Stars burn while in the air, producing color or streamer effects.

Structure. A combination of materials assembled at a fixed location to give support or shelter, such as a building.

Supervised Fireworks Display. *See* Fireworks Display.

Support Personnel. Any person who is not a performer or member or the audience. Among others, support personnel include the display crew of any production, stage hands, property masters, security guards, fire watch officers, janitors, or any other employee.

Temporary Storage. Storage of fireworks for less than 30 days in the aggregate in any calendar year.

Touring Production. Any production performed in more than one geographic location.

Trough. *See* Mortar Trough.

Wheel. An effect that rotates on a central axis consisting of multiple gerbs or drivers attached to a framework.

2.04: Certificates of Competency and Permits for Supervised Displays of Fireworks

(1) Certificate of Competency (Fireworks Display). No person shall conduct a Fireworks Display unless they possess a Certificate of Competency (Fireworks Display) granted by the Marshal.

(a) any person desiring a Certificate of Competency shall make application in writing to the Marshal, be 21 years of age or older, and shall submit to such examination and test as the Marshal shall prescribe. Upon payment of the required fee, the certificate, when issued, shall remain in effect for a period of two years unless suspended or revoked by the Marshal.

NON-TEXT PAGE

2.04: continued

1. The applicant shall pass a comprehensive written examination covering state laws, regulations and industry safety standards pertaining to the display of fireworks and 527 CMR 2.00.
2. The applicant shall provide evidence of active employment for a period of three years, on the crew for professional fireworks displays, to encompass a minimum of ten displays.
3. The applicant shall have at least two letters of reference from other licensed pyrotechnic operators within the state. At the option of the Marshal, an alternate requirement can be substituted.
4. The applicant shall provide evidence of having satisfactorily completed a recognized fireworks safety course, subject to review by the Marshal, during the past 12 months.

(b) The renewal of a Certificate of Competency (Fireworks Display) shall require:

1. Effective September 2, 2003, the holder shall pass a re-examination covering state laws, regulations and industry safety standards pertaining to the display of fireworks or special effects, as the case may be.
2. Proof of actively participating in at least two displays during the prior two years.
3. The applicant shall provide evidence of having satisfactorily completed a recognized fireworks safety course, approved by the Marshal, during the past 12 months.
4. A notarized statement attesting the person or firm understands the contents of 527 CMR 2.00 and M.G.L. c. 148. The statement shall be made part of the application.

(c) Any applicant for a Certificate of Competency to conduct Special Effect or Pyrotechnic Display Before a Proximate Audience shall, when fulfilling the requirements in 527 CMR 2.04(1)(a) and (b), provide evidence of knowledge and experience particular to the profession of conducting special effects displays. Such evidence shall include written documentation that the applicant has worked in at least ten special effects performances within two years from the date of application under the direct supervision of a person who possesses a valid certificate of competency for such special effects issued by the Commonwealth or such similar certificate issued by another state.

(d) Any person who possess a valid certificate of competency for Special Effects as of the effective date of 527 CMR 2.04(1), shall, as a condition to maintaining the continued validity of said certificate, submit to a re-examination, by the Marshal, of said individuals ability to conduct such displays in accordance with state law, regulation and industry safety standards. Any certificate, issued to a holder who has not taken and passed such a re-examination by May 7, 2003, shall be deemed null and void.

(e) The issuance of a Certificate of Competency for Special Effects shall not authorize the holder to conduct other types of fireworks displays. The issuance of a Certificate of Competency to conduct outdoor, marine or supervised displays of fireworks shall not authorize the holder to conduct Special Effects displays.

(2) Fireworks Users Certificate. No person or firm shall use fireworks, on or after June 1, 2001 unless they possess a Fireworks Users Certificate granted by the Marshal.

(a) Application for a Fireworks Users Certificate shall be made to the Marshal and shall include the following:

1. Evidence of a valid bond in accordance with M. G. L. c. 148, § 42.
2. A notarized statement indicating that fireworks materials shall be transported, stored and handled or used in accordance with 527 CMR 2.00.
3. A notarized statement attesting the person or firm understands the contents of 527 CMR 2.00 and M.G.L. c. 148. The statement shall be made a part of the application.

(b) The Fireworks Users Certificate shall expire upon the expiration of the bond. The Fireworks Users Certificate may be revoked by the Marshal for a failure by the holder of the User's Certificate or his agents to comply with the terms of the User's Certificate or any provision of 527 CMR 2.00, or M.G.L. c. 148.

(3) Permit to Display Fireworks (Supervised Display of Fireworks): No person or firm shall detonate or use fireworks unless they possess a Permit to Display Fireworks obtained from the head of the fire department in the city or town where the Fireworks are to be displayed, or the Marshal in all other jurisdictions.

2.04: continued

(a) Application for a Permit to Display Fireworks shall be made by a competent operator(s) and shall be in writing on forms furnished by the Department of Fire Services.

(b) Application shall be made in writing to the head of the fire department in the city or town where the Fireworks are to be displayed, or the Marshal in all other jurisdictions, at least 15 days in advance of the display.

(c) Such application shall set forth:

1. The name, address, and phone number of the person, group, or organization sponsoring the fireworks display, hereinafter known as the sponsor.
2. The date and time of day at which the fireworks display is to be held, with a proposed rain/wind date and time in the event the display is postponed.
3. The exact address of the display.
4. A diagram of the site on which the display is to be held showing the point(s) at which the fireworks are to be discharged, the location of the audience, as applicable, all buildings, highways and other lines of communication, the lines behind which the audience is to be restrained or separated, and the location of other possible overhead obstructions such as nearby trees, telephone or telegraph lines.
5. The name, address, and phone number of the supplier of the fireworks to the operator, if different than that of the operator.
6. The name and home address of the competent operator who is to be responsible for the actual discharge of the fireworks constituting the display. In the event that the above named operator is unable to be present, an approved competent operator may be substituted. The head of the fire department shall notify the Marshal of such substitution within two working days following the display.
7. The approximate number and description of the fireworks to be discharged, the number and diameter of the largest shells, and whether manually or electrically fired.
8. The manner and place of storage of such fireworks prior to delivery to the fireworks display site.
9. Upon receipt of such application, the head of the fire department shall make or cause to be made an investigation of the pertinent facts set forth in the application and a physical inspection of the display grounds for the purpose of determining compliance with the provisions of 527 CMR 2.00. Upon completion of such investigation and inspection but no later than five days after receipt of said application, the head of the fire department shall transmit one copy of said application to the Marshal and one copy to the applicant with his endorsement thereon in compliance with provisions of law, or his reason or reasons for withholding such endorsement

(d) Said Permit to Display Fireworks Shall not be issued until the applicant (person):

1. Exhibits a valid "Certificate of Competency (Fireworks Display)". The holder of the certificate shall be of such character acceptable to the head of the fire department in the city or town where the fireworks are to be displayed, or the Marshal in all other jurisdictions or their designees.
2. Provides a complete written application particularly describing the operation of the display, the material to be used, the layout, fireworks storage, method and routes of delivery and any further information requested that may assure the display shall not be hazardous to property or endanger any person or persons.
3. Provides a copy of a bond running to the state treasurer in accordance with M.G.L. c. 148, § 42.
4. Provides a copy of a valid Fireworks User's Certificate.
5. Provides a letter from the owner, operator or manager of the entertainment venue or theatre (as defined by 527 CMR 2.09(3)) acknowledging the proposed use of pyrotechnics within their facility.

(e) A permit to Display Fireworks (Supervised Display of Fireworks) shall list the name of the sponsor and the person holding the Certificate of Competency (Fireworks Display) who shall be responsible for the display.

(f) A valid Permit to Display Fireworks (Supervised Display of Fireworks) and a Certificate of Competency (Fireworks Display) shall be in possession of the operator at the display site and shall be produced for inspection, in hand, when requested by the head of the fire department, the Marshal, or their designees.

(g) The head of the fire department or the Marshal may restrict the terms and conditions of a Permit to Display Fireworks (Supervised Display of Fireworks) if hazards to the safety of the public, not covered by 527 CMR 2.00 are identified, reduced to writing and made a part of the permit.

2.04: continued

(h) A Permit to Display Fireworks (Supervised Display of Fireworks) may be suspended or revoked by the head of the fire department or the Marshal or their designees for any violation of 527 CMR 2.00, or M.G.L. c. 148.

2.05: Manufacture of Fireworks

(1) NFPA No. 1124 Standard Incorporated by Reference.

(2) Massachusetts Requirements. 527 CMR 2.05(3) through (5) are requirements in addition to the incorporated standards.

(3) No person shall manufacture fireworks except in accordance with 527 CMR 2.00. The manufacture of any fireworks, as defined in 527 CMR 2.03, shall be prohibited unless it is authorized by federal license, or permit, and a license issued by the local licensing authority and a permit issued by the Marshal and is conducted in accordance with 527 CMR 2.00.

- (a) An application for the permit to manufacture fireworks, as required by M.G.L. c. 148, § 13, shall be accompanied by an attested or photostatic copy of the license granted by the local licensing authorities under M.G.L. c. 148, § 12, and by a plan drawn to scale showing the arrangement of the various buildings and magazines of the manufactory and the egress therefrom, their relative location to other buildings and property lines, shall clearly indicate:
    1. The location of the manufactory.
    2. The name of the owner and/or occupant.
    3. The kind and maximum quantities of the explosives, raw materials and finished products, and the manner in which they are to be kept or stored.
    4. The nature of the work to be carried on in each building.
- (b) Licenses or permits shall not be assigned or transferred.
- (c) The issuing authority shall be notified immediately of any change of business address.

(4) A fire safety analysis shall be required. A registered fire protection engineer shall conduct such analysis.

(5) The Marshal reserves the right to set additional restrictions and requirements as a condition of the permit to manufacture fireworks.

2.06: Transportation of Fireworks

(1) NFPA Standards No. 1123 and 1124 Incorporated by Reference.

(2) Massachusetts Requirements. 527 CMR 2.06(3) through (4) are requirements in addition to the incorporated standards.

(3) Permit Requirements. A permit shall be required for the transportation of fireworks or pyrotechnic material intrastate. Application for this permit shall be made to the Marshal.

- (a) Any vehicle used for the transportation of fireworks shall be so constructed that the fireworks shall be totally enclosed at all times and such enclosure shall be protected by a suitable lock.
- (b) Fireworks shall not be carried or transported in or upon a public conveyance or a vehicle carrying passengers for hire
- (c) At no time shall any vehicle containing fireworks be left unattended.
  Exception: *See* section 5-4.1.3 of NFPA 1124
- (d) Every vehicle containing fireworks shall display on both sides and on the front and rear thereof the appropriate DOT hazardous cargo placarding and each vehicle shall bear the owners name on each side thereof.
- (e) Each vehicle shall be equipped with at least two 10-BC portable fire extinguishers.
- (f) No person shall smoke, carry matches or any other flame producing device, or carry unauthorized firearms or cartridges while transporting fireworks. Road flares for use in manual ignition of fireworks may be carried provided they are properly separated from any fireworks cargo.
- (g) Fireworks shall not be transported through any prohibited vehicular tunnel or subway or over any prohibited bridge, roadway, or elevated highway.

2.06: continued

(h) No person shall drive, load, or unload a motor vehicle transporting explosive materials in a careless or reckless manner.

(i) No person under the age of 21 shall transport or possess fireworks regulated by 527 CMR 2.00

(j) In the event of a breakdown or collision, the head of the fire department and the police authority having jurisdiction shall be promptly notified.

1. Fireworks shall be transferred from the disabled vehicle to another under the supervision of a person qualified by the owner of the fireworks or at the direction of a police officer, fire officer or the Marshal.
2. Motor vehicles transporting fireworks shall not be towed while containing fireworks unless directed by a police officer, the head of the fire department, the Marshal or his designees.
3. Road Flares shall not be used for traffic warning devices.

(4) Delivery of Fireworks.

(a) Delivery of fireworks shall be made only to authorized persons who are in possession of a valid Certificate of Competency (Fireworks Display) and a Permit to Display Fireworks (Supervised Display of Fireworks).

(b) As soon as the fireworks have been delivered to a display site, they shall not be left unattended, and they shall be kept dry.

(c) Upon delivery of the fireworks to the display site, members of the public, the audience, spectators, and other persons not otherwise authorized by the head of the fire department or the Marshal, shall be kept at a distance not less than those specified in NFPA 1123 Table 3-1.3. (527 CMR 2.08-1). Minimum Separation Distances Mortars to Spectators for Land or Water Displays.

Exception: Where it is impractical to locate the delivery vehicle within the perimeter of the display site the vehicle shall be parked and secured. The minimum secured radius from any point of transfer of fireworks from the vehicle to the display site shall be 150 feet. Audience members, spectators and the general public shall not be allowed within this area.

2.07: Storage of Fireworks, Pyrotechnic and Explosive Compositions

(1) NFPA No. 1124 Incorporated by Reference.

(2) Massachusetts Requirements. 527 CMR 2.07(4) through (5) are requirements in addition to the incorporated standards.

(3) Storage of. Fireworks in excess of 30 days shall be in accordance with the provisions of 527 CMR 2.07 and the incorporated standard.

(a) A license shall be required from the local licensing authority

(b) In addition to the local requirements required by 527 CMR 2.07(3)(a), as of January 1, 2003, no magazine, building or structure shall be used for the manufacturing or storage of fireworks without a permit issued by the Marshal in accordance with the provisions of M.G.L. c. 148, § 12.

1. Permits for manufacture of fireworks shall be obtained from the Marshal in accordance with 527 CMR 2.05.
2. Permits for the storage of fireworks in any magazine, building or structure shall be obtained from the marshal by the owner of said magazine, building, or structure. The application for said permit shall contain the location of the subject magazine building or structure, the nature and quantity of fireworks to be stored, and the capacity and specifications of the storage and any other information as prescribed by the Marshal in said application.
3. No permit or renewal thereof shall be issued by the Marshal under 527 CMR 2.07(3)(b) until the owner of said magazine, building or structure provides proof that the owner has met all requirements required by State and Federal law or regulation.
4. The Marshal may suspend or revoke a permit issued under 527 CMR 2.07(3)(b) if the marshal has reason to believe that the permit holder has violated the provisions of 527 CMR 2.00, or any law or other regulation related thereto.

2.07: continued

5. Any person who has applied for or has been issued such a permit or a renewal thereof by the marshal, under 527 CMR 2.07(3)(b), shall be deemed to have consented to periodic administrative inspections by the Marshal or his designees of any building, structure, magazine or facility used to store or manufacture such fireworks and all records relating thereto.
6. Any owner who has been issued a permit under 527 CMR 2.07(3)(b) shall notify the Marshal immediately of the sale or transfer of a magazine, building or structure. The owner shall remove the permit number from the magazine, building or structure upon sale or transfer. The transferee shall immediately apply for a new permit for the magazine, building or structure in accordance with 527 CMR 2.07(3)(b).

(4) No person shall keep or store fireworks, pyrotechnics and explosive compositions or materials except in accordance with 527 CMR 2.00.

(a) All fireworks, pyrotechnics and explosive compositions or materials and devices not stored in magazines shall remain in their prescribed U.S. Department of Transportation containers until it becomes necessary to set them up for a performance. Unless the pyrotechnic special effect devices are secured or inaccessible, they shall be supervised.

Exception: Unless pyrotechnic special effects are located in an inaccessible, secured or supervised location.

(b) All buildings where fireworks are manufactured, kept or stored shall be open to inspection by the State Fire Marshal or the head of the fire department or their designees.

(5) Temporary Storage.

(a) Except as otherwise provided by M.G.L. c. 148, § 40, 527 CMR 2.00 and 527 CMR 13.00, fireworks and pyrotechnic material may be temporarily kept or stored in a building or part thereof in quantities not to exceed 2000 lbs., provided that the building or part thereof is not open to access by the public, and is kept secure from the public, and/or is guarded under such conditions as required by the head of the fire department.

NON-TEXT PAGE

2.07: continued

1. Fireworks kept in excess of 2,000 lbs shall be kept or stored in a building located at a distance not less than 1000 feet from any other building under such conditions as required by the head of the fire department.
2. All fireworks kept or stored in a building shall be kept in wooden boxes with tightly closed covers or in approved DOT Shipping containers.

(b) All premises used for keeping or storing of fireworks shall be provided with such fire extinguishing equipment as may be required by the Marshal or head of the fire department.
(c) No smoking shall be allowed about the premises where fireworks are kept or stored, and notices to that effect shall be conspicuously posted on the premises.
(d) Ready boxes may be utilized during a fireworks display provided that such ready boxes comply with the provisions of 527 CMR 2.08(3)(j).
(e) A permit from the head of the fire department or the Marshal shall be required for the storage of all fireworks, pyrotechnic or explosive compositions.

All such permits for the storage of fireworks shall remain in effect for a period of time as determined by the Marshal or the head of the fire department and may be suspended or revoked for cause by the head of the fire department or the Marshal. Such permits shall be obtained from the head of the fire department in the city or town where the fireworks are to be stored, or the Marshal in all other jurisdictions.

(f) The head of the fire department or the Marshal may authorize, by stating on a permit to Display Fireworks (Supervised Display of Fireworks) the temporary keeping or storing of Fireworks pursuant to the fireworks display authorized by the display permit.

2.08: Supervised Display of Fireworks Outdoors

(1) NFPA Standard No.1123 Incorporated by Reference.

(2) Massachusetts Requirements. 527 CMR 2.08(3) through (8) are requirements in addition to the incorporated standards. The appendix in NFPA 1123 shall be a requirement of 527 CMR 2.08.

(3) 527 CMR 2.08 shall specifically apply to fireworks displays outdoors. Any fireworks display that does not meet the requirements of a proximate audience shall be considered a fireworks display outdoors.

(a) Before the performance of any fireworks display outdoors in which fireworks are to be used a Permit to Display fireworks, as required by 527 CMR 2.04(3), shall be obtained. The permit applicant shall submit a plan describing the types, quantity and arrangement of the fireworks to be used to the head of the fire department. After a permit has been granted, the permittee shall keep the plan available at the site for inspectors or other designated agents of the head of the fire department or the Marshal. Any performance adding fireworks different from the performance described in the permittee's plan shall require approval by the head of the fire department.
(b) The audience at a supervised display of fireworks shall be restrained behind a suitable barrier such as snow fencing or its equivalent. Material of substantial strength, uniformly supported and providing an uninterrupted barrier both vertically and horizontally and of a height of no less than 40 inches shall be accepted as an equivalent. Such barrier shall clearly define the restricted discharge area. This restricted area shall be defined based on the minimum separation distances specified by NFPA 1123 Table 3-1.3. (527 CMR 2.08 Table 2.08-1, 2.08-1.2, 2.08-1.3)
(c) Natural barriers such as restrictive terrain, or bodies of water, may be utilized in conjunction with the requirements set forth in 527 CMR 2.08(3)(b), provided that prior approval has been obtained from the Marshal.
(d) Fireworks displays shall not be held during storms or inclement weather, when such weather conditions will interfere with the safe operation or discharge of the display. Fireworks displays shall not be held when the wind velocity exceeds 20 miles per hour at ground level. The operator shall have available for use at all times a portable anemometor or similar device for measuring wind velocity. Any supervised display of fireworks shall be stopped immediately in the event that upper level wind conditions cause the fall out area to

2.08: continued

change and pose a threat to public safety or property. A test shot shall be provided to check for high level winds at the request of the head of the fire department or the Marshal.

(e) It shall be the responsibility of the competent operator to determine that the area in which the display is to be discharged is safe and that 527 CMR 2.00 is complied with in all respects. The competent operator shall be responsible for all notifications to the F.A.A. or U.S. Coast Guard, or any other governmental agency with jurisdiction. The competent operator, the Marshal, or the head of the fire department may order the postponement of the display for any violation of 527 CMR 2.00.

(f) Support personnel and assistants shall operate under the direct supervision of a competent operator and shall be a minimum of 18 years of age.

(g) It shall be the responsibility of a competent operator to insure that a thorough search of the display area is made for any unignited fireworks or remnants thereof containing explosives. Such search shall be conducted forthwith and at the first available daylight following the display. Upon completion of the search, a competent operator shall report all findings to the head of the fire department in the municipality where the display was held. It shall be the responsibility of a competent operator to dispose of any such items found.

(h) The head of the fire department shall designate the location and the type of fire extinguishing equipment as may be required.

(i) The sponsor shall be responsible for the detailing of one or members of the fire department as may be required by the head of the fire department. They should be on duty from the time the fireworks are delivered to the site until the termination of the display and removal of all fireworks and debris from the site. For the purposes of 527 CMR 2.00 the word "debris" shall include any unignited fireworks or remnants thereof containing explosives.

(j) During a fireworks display, all manually fired shells shall be stored and drawn as needed from suitable wooden supply boxes kept at minimum distance of 25 feet upwind from the nearest launch mortars used in the display. All such boxes shall be provided with access covers, and the boxes shall be so positioned that they will open from the side most remote from the launch mortar then being used. All such supply boxes shall be further provided with a tarpaulin or other fire resistant covering.

(k) Any explosion, fire or other accident occurring in connection with the keeping, storage, manufacture, handling, transportation, supervised display or other disposition of fireworks causing loss of life or injury to any person or damage to property shall be reported by the competent operator immediately to the Marshal, giving a detailed account of same and confirmed in writing.

Table 2.08 - 1

NFPA 1123 Table 3-1.3 Distances for Outdoor Fireworks Display Sites

Minimum separation distances Mortars to Spectators for Land or Water Displays

Mortar Size[1](in.)	Minimum Secured Diameter of Site[2]	Minimum Distance to Spectators for Vertical Mortars[3] (ft)	Minimum Distance to Spectators for Angled Mortars[4] ⅓ Offset (ft)	Mortars to Distance to Special Hazards[5] (ft)
<3	280	140	95	280
3	420	210	140	420
4	560	280	190	560
5	700	350	230	700
6	840	420	280	840
7	980	490	320	980
8	1120	560	370	1120
10	1400	700	460	1400
12	1680	840	560	1680

(Note: The footnotes listed below refer to sections of NFPA 1123.)

1. *See* 2-1.1. 2) *See* 3-1.3. 3) *See* 3-2.3.

4. *See* 3-2.3.1. Note that for angled mortars, the minimum secured diameter of the display site does not change. Only the location of the mortars within the secured area changes when the mortars are angled.

5. *See* 3-1.3.2 Note that this is only the distance to the special hazards. The minimum secured diameter of the display site does not change.

6. For multiple shot mortar devices using mortars less than three inches in diameter such as cakes, repeaters etc. the minimum secured diameter of the display site and minimum distance to spectators and special hazards shall be equal to three inch mortars.

2.08: continued

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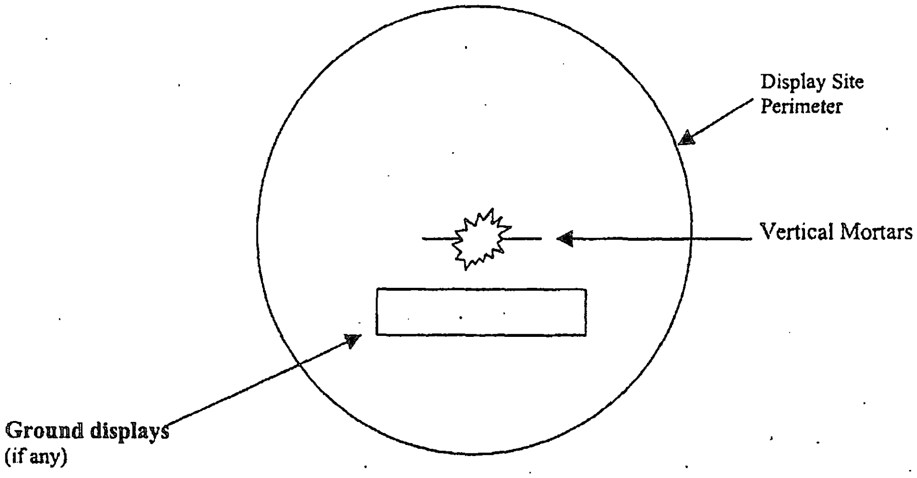
Table 2.08 – 1.2

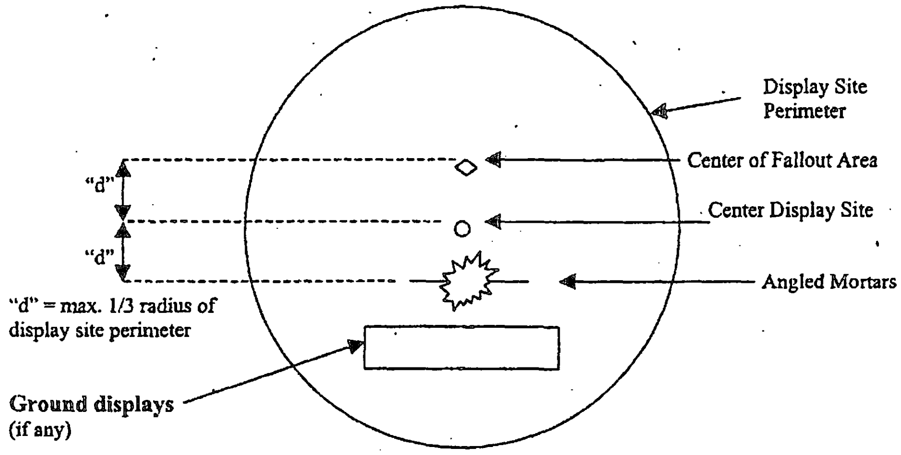
NFPA 1123 Figure A-3.2.3 Typical Layout for a display site with vertical mortars



Spectator Viewing Area

Table 2.08 – 1.3

NFPA 1123 Figure A-3-2.3.1 Typical layout for a display using angled mortars
The distance "d" shall be at least 1/6 but not more than ⅓ the radius of the circle indicating the minimum distance to the secured boundary.



Spectator Viewing Area

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(4) Fireworks Launch Mortars.

(a) No fireworks display shall include mortars or shells in excess of 12 inches in diameter unless the competent operator shall have obtained prior approval from the Marshal.

2.08: continued

(b) Multiple shot mortars shall be constructed of non – fragmentary steel, or other approved material not less than ¼ inch thickness, and shall be capped at the base by a welded cap of like material. No wood plug base ends shall be permitted.

1. Multiple shot mortars up to eight inches in diameter shall be buried in a trench not less than 18 inches apart to a depth of not less than ¾ of their length, but in no case shall the protrusion above the ground be greater than eight inches. The trench shall be provided with wooden base planking at least four inches thick and shall be equivalent in width to the largest diameter mortar used.
2. The portion of the mortar tube extending above ground shall be supported with railroad ties or their equivalent placed on both sides of the tubes and shall be firmly secured together by wood or metal connecting straps. All remaining space between mortars shall be filled with firmly tamped sand or earth.
3. In display locations where ground excavation or "trenching" is not feasible, the head of the fire department may allow multiple shot mortars up to ten inches in diameter to be buried to ¾ of their length in sturdy wooden boxes (volley or blast box) or partitions at least two feet wide by three feet in height, filled with clean sand and provided with 18 inches spacing between mortars. Sturdy 55 gallon drums filled with clean sand may also be used with no more than two mortars in each drum.

(c) Single shot or "finale" mortars may be constructed of steel with welded seams, high density polyethylene (HDPE), fiberglass reinforced epoxy, or of convolute or spiral paper in accordance with table 2.08-2.(A) through (E). Wooden plug base ends shall be permitted for single shot or "finale" mortars, except fiberglass reinforced epoxy mortars. Fiberglass reinforced epoxy mortars shall have epoxy welded bases two inches thick.

TABLE 2.08 - 2

Table 2.08-2 A

Minimum Mortar Wall Thickness (in.) for Steel Mortars[1]

Mortar ID (in.)	Spherical	Cylindrical Single Break	Cylindrical Multi-Break[2]
3	0.04	0.11	0.21
4	0.05	0.12	0.23
5	0.06	0.13	0.25
6	0.07	0.14	0.27
8	0.09	0.16	0.31
10	0.11	0.18	0.35
12	0.13	0.20	0.39

For SI units: 1 in. = 25.4 mm.

1. The tensile strength of steel pipe should be at least 40,000 psi (275,800 kPa).
2. Wall thicknesses are those of American National Standard ANSI/ASME B 36.10M, Welded and Seamless Wrought Steel Pipe, 1985. (Schedule 40 wrought pipe).

Table 2.08-2 B

Minimum Mortar wall Thickness (in.) for Paper Mortars (Convolute or Spiral)[1]

Mortar ID (in.)	Spherical	Cylindrical Single Break	Cylindrical Two Break
3	0.25	0.25	0.37
4	0.25	0.33	0.50
5	0.31	0.42	0.62
6	0.37	0.50	0.75
8	0.50	0.62	*See* note # 2
10	0.62	*See* note # 2	*See* note # 2
12	0.75	*See* note # 2	*See* note # 2

For SI units: 1 in. = 25.4 mm.

1. The cross-grain tensile strength of the paper should be at least 2300 psi (16,000 kPa).
2. Not permitted

2.08: continued

Table 2.08-2 C

Minimum Mortar Wall thickness (in.) for High density Polyethylene Mortars[1]

Mortar ID (in.)	Spherical	Cylindrical Single Break	Cylindrical Two Break
3	0.15	0.20	*See* note # 2
4	0.20	0.26	*See* note # 2
5	0.25	0.25	*See* note # 2
6	0.30	0.30	*See* note # 2

For SI units: 1 in. = 25.4 mm.

1. The tensile strength of plastic should be at least 3500 psi (24,000 kPa).
2. Not permitted

Table 2.08-2 C -1

Minimum Mortar Wall thickness (in.) for High density Polyethylene Mortars[1]

(Unique to Massachusetts and not part of NFPA)

Mortar ID (in.)	Spherical	Cylindrical Single Break	Cylindrical Two Break
8	0.332	0.332	*See* note # 2
10	0.331	0.331	*See* note # 2
12	0.392	0.392	*See* note # 2

For SI units: 1 in. = 25.4 mm.

1. The tensile strength of plastic should be at least 3500 psi (24,000 kPa).
2. Not permitted

Table 2.08 – 2 D

Minimum Mortar Wall Thickness (In.) for Fiberglass Reinforced Epoxy (With epoxy welded 2" bases)[1]

Mortar ID (in.)	Spherical	Cylindrical Single Break	Cylindrical Two Break
3	0.11	0.11	*See* note # 2
4	0.11	0.11	*See* note # 2
5	0.11	0.11	*See* note # 2
6	0.11	0.11	*See* note # 2
8	0.25	0.25	*See* note # 2
10	0.25	0.25	*See* note # 2
12	0.375	0.375	*See* note # 2

1. Tensile strength of Fiberglass Reinforced Epoxy should be at least 11,000 psi
2. Not permitted

Table 2.08 -2 E

Minimum Inside Mortar Length Inches

Mortar ID (in.)	Single Break	Double Break	Up to 4 - Break
3	15	18	21
4	20	23	27
5	24	28	32
6	28	32	37
8	34	40	46
10	40	46	54
12	46	52	62

For SI units: 1 in. = 25.4 mm

(d) Single shot aluminum mortars shall be limited to four inches in diameter.

(e) Each finale mortar shall be buried in a trench at least three quarters of its length, but in no case shall the protrusion aboveground exceed ten inches. Burial shall be in trench only. Finale mortars shall not be buried in rows in an open pit like excavation.

(f) The time rack or fence, so called, used for tying the leaders of each shell shall be so constructed that the fence shall at no time exceed the height of the finale mortar opening.

2.08: continued

(g) In display locations where ground excavation or "trenching" is not feasible, the head of the fire department may allow single shot mortars up to eight inches in diameter to be buried to ⅔ of their length in sturdy boxes at least two feet wide, filled with clean sand, and provided with spacing between mortars equal to at least ½ the diameter of any adjacent mortar, or single shot mortars up to 12 inches in diameter and buried to ⅔ of their length in separate sand filled boxes or drums.

(h) Multiple shot mortar devices using mortars less than three inches in diameter such as cakes, repeaters, etc. shall be buried ⅞ their length in a trench, mortar trough, or sturdy drum filled with clean sand. The spacing between the outside of the cake, repeater or device and the mortar trough or drum shall be equal to at least ½ the width and length of the cake, repeater or device. The head of the fire department may allow for an equivalent alternative, such as sand bags, provided the same degree of protection is provided.

(5) Mortar Racks.

(a) In display locations where ground excavation or "trenching" is not feasible, the head of the fire department may allow single shot or "finale" mortars up to six inches in diameter to be rack-mounted to adequately constructed wooden racks.

(b) Spacing between mortars in a rack shall be at least ½ the diameter of the adjacent mortar.

(c) Each mortar shall be securely fastened to its rack, and each rack shall be securely supported at each end.

(d) Parallel racks or rows of racks shall be no less than two feet apart

1. Exception # 1: For electrically fired displays parallel racks or rows of racks shall be separated by a minimum distance not less than twice the inside diameter of the largest mortar in an adjacent rack.

2. Exception # 2: For manually fired "Finale" or "barrage" effect displays that utilize chain fusing, where the largest mortars are limited to four inches in diameter, parallel racks or rows of racks shall be separated by a minimum distance of not less than twice the inside diameter of the largest mortar in an adjacent rack.

(6) Dense Pack Portable Firing Trailers.

(a) Dense pack portable firing trailers shall be approved by the Marshal, subject to restrictions and inspections as established by the Marshal.

(b) Fireworks displays that utilize dense pack portable firing trailers shall be electrically fired.

(c) All dense pack portable firing trailers shall be accompanied by a permit issued by the Marshal.

(7) Remote Electrical Displays.

(a) All electrical firing units shall be of a type approved by the Marshal, and all devices, wiring, connections, etc., shall be adequately maintained and installed in a workman-like manner.

(b) All electrical firing units, other than single circuit hand held units, shall be equipped or retrofitted with a key operated switch or similar device on or before May 1, 2000 in conformance with NFPA 1123 section 5-2.2.

(c) All firing devices or control panels shall be provided with shunting across the firing leads to insure against accidental discharge. The control firing leads shall be shunted before the attachment of the electrical matches and shall remain shunted until the actual time of the display.

(d) All firing units shall be provided with an emergency electrical disconnect which will de-energize the entire system in the event of an emergency.

(e) All electrical matches shall be pre-attached at the factory and remain shunted until the complete device is loaded into the firing position and ready to be wired in proper sequence into the firing circuit.

(f) All wiring and firing system setups shall be done under the direct control of the competent operator who shall also insure that the firing device or control panel is properly safeguarded.

(8) Marine Displays.

(a) 527 CMR 2.08(8) shall specifically apply to the use and display of fireworks, at a Marine Display.

2.08: continued

(b) Before the performance of any Marine Display, a permit to Display Fireworks, as required by 527 CMR 2.04(3), shall be obtained. The permit applicant shall submit a plan describing the types, quantity, and arrangement of the fireworks to be used to the head of the fire department. After a permit has been granted, the permittee shall keep the plan available at the site for inspectors or other designated agents of the head of the fire department or the Marshal. Any display adding fireworks different from the display described in the permittee's plan shall require approval by the head of the fire department.

(c) All barges and vessels used as launch platforms for the supervised display of fireworks shall be open to inspection by the Marshal, head of the fire department, harbormaster having jurisdiction, or to any person delegated by the aforementioned.

(d) All such barges or vessels shall be of sturdy, seaworthy construction, properly maintained, and provided with adequate towing, anchor, and mooring lines or chains. When a barge is secured at anchorage secondary mooring lines of equal value to the primary mooring lines shall be employed. Use of tugs or other vessels for securing a barge at anchor is forbidden. EXCEPTION: *See* 527 CMR 2.08(8)(a)

(e) No barge or vessel used for the transportation of flammable, combustible or other hazardous material, above or below deck, shall be used unless such flammable, combustible or hazardous material, its residue and vapors have been removed and the barge or vessel is certified to be free of such vapors. This shall be accomplished by the use of a Marine Chemist who shall attest to this fact in writing.

(f) All barges and vessels with decks of wooden construction shall have all exposed decking covered with a minimum of two inches of clean sand.

(g) Any barge or vessel containing fireworks on any waters of the Commonwealth shall have signs affixed midship, visible on both sides thereof, the word "FIREWORKS" in six-inch-high red lettering on a white background. Further, such vessel shall display on a suitable staff an international Code Flag B, Which shall be readily discernible from a distance of not less than 1000 feet by day and shall be properly illuminated at night.

(h) No personnel other than the competent operator (s), or authorized personnel as approved by the head of the fire department, shall be allowed on such barge during the display. A crew list indicating the full name and home addresses of each individual, and the purpose for which they shall be employed while aboard the barge shall be submitted to the head of the fire department prior to the display. The barge shall be equipped with a suitable means of shelter so as to provide sufficient protection to prevent debris from falling on the personnel, and shall provide protection from malfunctioning product.

(i) No smoking shall be allowed on any barge or vessel containing fireworks.

(j) Each such barge or vessel shall be equipped with at least two portable fire extinguishers as directed by the head of the fire department, the Marshal or their designees.

(k) All barges and vessels shall be subject to assignment as to cargo loading and display locations by the head of the fire department.

The location for anchoring, or mooring, shall also be approved by the Harbormaster having jurisdiction.

(l) It shall be the responsibility of the competent operator to insure:

1. The display is in conformance with any U.S. Coast Guard standards or requirements and that adequate notice is given to any concerned parties such as local airports, private marinas, etc.

2. That the area on all sides of the barge or vessel is free of all unauthorized personnel, vessels, and water craft. All such personnel and vessels shall be kept at a distance in accordance with Table 2.08 - 1

(m) All fireworks shall be set up and discharged in accordance with 527 CMR 2.00

(n) All marine fireworks displays shall be fired using electrical ignition.

2.09: Theatrical Special Effects or Pyrotechnics Display Before a Proximate Audience

(1) NFPA Standard No. 1126 Incorporated by Reference.

(2) Massachusetts Requirements. 527 CMR 2.09(3) through (16) are requirements in addition to the incorporated standards.

(3)(a) The use of pyrotechnic special effects outdoors shall be permitted provided 527 CMR 2.08 or 527 CMR 2.09 are complied with.

2.09: continued

(b) The use of pyrotechnic special effects indoors is prohibited in nightclubs, discotheques, dance halls, bars or similar occupancies. The use of pyrotechnic special effects indoor in entertainment venues (defined as A-3 by 780 CMR) and theatres (defined as A-1 by 780 CMR) shall be permitted provided the facility is protected with automatic sprinklers to the extent required by law or regulation. Approval of the use of pyrotechnic special effects shall be subject to such terms and conditions as the head of the fire department may require.

(4) Any person wishing to conduct a display of special effects fireworks shall first make an application for such supervised display as required by 527 CMR 2.04 and shall be further limited as follows:

(a) Every supervised display of "Special Effects" shall be handled by a person who possesses a valid certificate of competency to conduct special effects issued by the Marshal in accordance with the provisions of 527 CMR 2.04(1)

(b) The head of the fire department shall, forthwith, make a written report to the Marshal stating the details of any incident resulting in any injury to persons or property during an activity involving special effects.

(c) Application for a "limited special effects permit" for the supervised display of theatrical special effects shall be obtained from the head of the fire department. Application for such permit shall be submitted at least 15 days in advance of the date of the display and shall set forth:

1. The date, time, and location of the display.
2. The name, address, and certificate number of the competent operator.
3. The types, amounts, and description of the pyrotechnics to be used, accompanied by appropriate sketches or diagrams showing the exact location of each during the display.
4. The location, manner of storage, type of storage facility, and total amounts to be stored.
5. Evidence of a valid certificate of insurance for liability to the city or town , in an amount approved by the head of the fire department.

(d) The display shall be under the supervision of an individual competent operator holding a Certificate of Competency for Special Effects issued by the Marshal, and valid for two years unless suspended or revoked by the Marshal.

(5) The applicant for the limited special effects permit shall demonstrate the complete fireworks display in the presence of the head of the fire department or his designees at least four hours before the performance at the proposed location of the performance and shall give the head of the fire department at least four days' notice of such demonstration. The head of the fire department may waive the requirements of 527 CMR 2.09(5) if he or his designee has witnessed essentially the same display at a similar separate location.

(6) Denial of the Application. Denial of the application for the use of special effects fireworks for just cause shall be determined by the head of fire department within a maximum of 24 hours after witnessing the preliminary display, and the applicant shall be so notified in writing within the next 24 hours with the reasons for such denial detailed. The applicant shall then have the right of appeal to the Marshal within 48 hours.

(7) Pyrotechnic Composition or Devices to be Used.

(a) Only approved types and amounts of pyrotechnic compositions and devices as listed on the permit application shall be used.

(b) Pyrotechnic compositions and devices shall be ignited and supervised continuously by the person holding the certificate of competency for the conducting of the display in question.

(8) Approved Pyrotechnic Compositions, Devices, Containers, and Detonating Mechanisms to be Used. Only those pyrotechnic compositions, devices, containers, and detonating devices listed in the application and approved by the Marshal shall be used. All pyrotechnic devices and containers shall be fixed in their detonating positions as approved by the operator. Any device from which residue may be projected shall either be protected by a securely attached metallic screen or be relocated to a point where such residue will not endanger the audience.

2.09: continued

(9) Detonating Mechanisms. The competent operator shall supervise the loading and wiring of each device and all firing shall be done from a central control location affording the operator an unobstructed view of each effect.

(10) Prohibited Special Effects Displays. No bombs, salutes, Roman candles, skyrockets, firecrackers, torpedoes, or similar fireworks shall be used in a special effects display unless previously specifically approved in writing by the Marshal.

(11) Audience Location. Audience location shall be in conformance with NFPA 1126

(12) Suspended Devices. The chemical composition of any suspended special effects shall be such as to self extinguishing at least ten feet above any object below. No such device shall be located above the audience.

Exception: Line or Grid rockets may be allowed with written approval of the head of the fire department provided that they are sturdily constructed and properly secured.

(13) Disposal of Unfired Special Effects Materials. Any special effects materials that remain unfired after the display is concluded shall be immediately disposed of or removed in accordance with NFPA 1126 sec 6-7.

(14) The theatre, auditorium, or similar facility shall certify that the proscenium wall and curtain are in compliance with 780 CMR and that all combustible materials used in sets and scenery have been rendered flame resistant in compliance with 780 CMR.

(15) The Marshal, the head of the fire department. or designee of either, may order the cancellation of any display for violation of any of 527 CMR 2.00.

(16) Storage Storage of special effects fireworks shall be in accordance with NFPA 1126 sec 6-1.3 and 6-1.4.

REGULATORY AUTHORITY

527 CMR 2.00: M.G.L. c. 148, § 10.

NON-TEXT PAGE

527 CMR 3.00: DRY CLEANING AND DRY DYEING AND THE KEEPING, STORAGE AND USE OF CLEANING AND DYEING FLUIDS

Section

3.01: Adoption by Reference
3.02: Referenced Publications

3.01: Adoption by Reference

New and existing dry cleaning plants shall comply with NFPA 32, Standard for Drycleaning Plants listed in 527 CMR 49.00

3.02: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 3.00 shall be considered a part of the requirements of 527 CMR 3.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 3.00: M.G.L. c. 148, § 10.

(PAGES 27 THROUGH 36 ARE RESERVED FOR FUTURE USE.)

527 CMR 4.00: OIL BURNING EQUIPMENT

Section:

4.01: Scope
4.02: Definitions
4.03: General Requirements
4.04: Oil Burners, Light Fuel Oil Type
4.05: Oil Burners, Heavy Fuel Oil Type
4.06: Range Oil Burners
4.07: Room Heaters, Water Heaters and Miscellaneous Oil Burning Equipment
4.08: Referenced Publications

4.01: Scope

(1) 527 CMR 4.00 shall apply to the installation of oil burning equipment that has the principal intent of producing heat. It applies to oil-fired stationary equipment, including but not limited to industrial, commercial, and residential-type steam, hot water, or warm air heating plants; domestic-type range burners and space heaters; portable oil burning equipment; and, further, including all accessory equipment and control systems, whether electric, thermostatic, or mechanical, and electrical wiring in connection therewith. 527 CMR 4.00 shall not apply to diesel fueled engines.

(2) 527 CMR 4.00 does not apply to internal combustion engines, oil lamps, and portable devices such as blow torches, melting pots, and weed burners.

(3) 527 CMR 4.00 shall not apply to fuel oil burners installed in steam boilers of nine horsepower and over and operated above 15 PSI both conditions existing based on M.G.L. c. 146, § 48, Licenses of Engineers and Firemen, but shall apply to the fuel oil storage tank, permit or license in connection therewith.

4.02: Definitions

For the purpose of 527 CMR 4.00, the following words shall have the meanings respectively assigned to them:

Air Heater. An indirect-fired appliance intended to supply heated air for space heating and other purposes, but not intended for permanent installation.

Air Pressure Switch. An electrical switch designed to prove that the proper draft has been established by the power venter or burner and allows the burner to operate. If the power venter or burner is not performing so as to satisfy the operating requirements of the equipment for safe performance, the switch will de-energize the burner control circuit preventing the burner from operating.

Anti-flooding Device. A primary safety control that causes the flow of fuel to be shut off upon a rise in fuel level or upon receiving excess fuel, and which operates before the hazardous discharge of fuel can occur.

Appliances, Industrial.

(a) Low-Heat Industrial Appliance. An industrial appliance such as a commercial cooking range, pressing machine boiler at any pressure, bake oven, candy furnace, stereotype furnace, drying and curing appliance, and other process appliances in which materials are heated or melted at temperatures (excluding flue-gas temperatures) not exceeding 600°F (316°C).

Appliances otherwise classed as medium-heat appliances may be considered as low-heat appliances if not larger than 100 cubic feet (2.8 m^3) in size excluding any burner equipment and blower compartment.

4.02: continued

(b) Medium-Heat Industrial Appliance. An industrial appliance such as an annealing furnace (glass or metal), charcoal furnace, galvanizing furnace, gas producer, commercial or industrial incinerator, and steam boiler operating at over 50 psig (345 kPa) pressure when such appliance is larger than 100 cubic feet (2.8 m^3) in size, and other furnaces classified as medium-heat appliances in accordance with recognized good practice.

Appliances otherwise classed as medium-heat appliances may be considered as low-heat appliances if not larger than 100 cubic feet (2.8 m^3) in size excluding any burner equipment and blower compartment.

(c) High-Heat Industrial Appliance. An industrial appliance such as billet and bloom furnace, blast furnace, brass melter, cupola, glass furnace, open-hearth furnace, and ceramic kiln and vitreous enamelizing oven (ferrous metals) when such appliances are larger than 100 cubic feet (2.8 m^3) in size, and other furnaces classified as high-heat appliances in accordance with recognized good practice.

Application Permit/Certificate of Completion. A standard form issued for use in all jurisdictions throughout the Commonwealth.

Approved. Unless otherwise indicated, listed or approved by a nationally recognized testing laboratory.

Authority Having Jurisdiction. The state fire marshal or his designee.

Boiler. A closed vessel in which water is heated, steam is generated, steam is superheated, or any combination thereof, by the application of heat from combustible fuels in a self-contained or attached furnace.

Boiler, High Pressure. A boiler for generating steam at pressures in excess of 15 psi (103 kPa), or for heating water to a temperature in excess of 250°F (121°C) or at a pressure in excess of 160 psi (1103 kPa).

Boiler, Hot Water Supply. A low-pressure hot water boiler having a volume exceeding 120 gallons (454 L), or a heat input exceeding 200,000 Btu per hour (58.6 kw) or an operating temperature exceeding 200°F (93°C) that provides hot water to be used externally to itself.

Boiler, Low Pressure. A boiler for generating steam at pressures not in excess of 15 psig (103 kPa) or for furnishing water at a temperature not in excess of 250°F (121°C) at pressures not in excess of 160 psig (1103 kPa).

Burner, Automatically Ignited. A burner equipped so that main burner fuel may be turned on and ignited automatically.

Burner, Manually Ignited. A burner equipped so that main burner fuel is turned on only by hand and ignited under supervision.

Burner, Mechanical Draft Type. A burner that includes a power-driven fan, blower, or other mechanism as the primary means for supplying the air for combustion.

Burner, Natural Draft Type. A burner that depends primarily upon the natural draft created in the chimney or venting system to induce the air required for combustion into the burner.

Central Heating Appliance. A stationary heating appliance comprising the following classifications: boilers, central furnaces, floor furnaces, and wall furnaces. A floor-mounted unit heater to be connected to a duct system is classified also as a central heating appliance.

4.02: continued

Centralized Oil Distribution System. A system of piping through which oil is supplied from a separate central supply tank or tanks to more than one building, mobile home, recreational vehicle, or other structure.

Certificate of Completion. A standard form issued for use in all jurisdictions throughout the Commonwealth.

Chimney. *See* 780 CMR: *Massachusetts State Building Code.*

Chimney Connector. The pipe that connects a fuel-burning appliance to a chimney.

Clearance. The distance between a heat-producing appliance, chimney, chimney connector, vent, vent connector, or plenum, and other surfaces.

Combustible Material. Material made of or surfaced with wood, compressed paper, plant fibers, plastics, or other material that will ignite and burn, whether flame-proofed or not, or whether plastered or unplastered.

Confined Space. Any space whose volume is less than 50 cubic feet per 1,000 Btu/hr ($4.8m^3$ per kw) of the aggregate input rating of all fuel-burning appliances installed therein.

Constant-Level Valve. A device for maintaining within a reservoir a constant level of oil fuel for delivery to an oil burner.

Control, Limit. An automatic safety control responsive to changes in fluid flow or level, pressure, or temperature, and which is normally set beyond the operating range for limiting the operation of the controlled equipment by shutting off the energy supply.

Control, Primary Safety (Combustion Safeguard). A safety control responsive directly to flame properties, sensing the presence or absence of flame and, in the event of ignition failure or unintentional flame extinguishment, causing safety shutdown.

Control, Safety. Automatic controls (including relays, switches, and other auxiliary equipment used in conjunction therewith to form a safety-control system) that are intended to prevent unsafe operation of the controlled equipment.

Cooking Appliance, Floor-Mounted Restaurant-type. A range, oven, broiler, or other miscellaneous cooking appliance of a type designated for use in hotel and restaurant kitchens and for mounting on the floor.

Damper. A valve or plate for controlling draft or the flow of gases including air.

Direct-Fired Appliance. A fuel-burning appliance in which the products of combustion (flue gases) are mixed with the medium (*e.g.*, air) being heated.

Direct Vent Appliance. A system consisting of an appliance, combustion air and flue gas connections between the appliance and the outside atmosphere, and a vent cap supplied by the manufacturer, and constructed so that all air for combustion is obtained from the outside atmosphere and all flue gases are discharged to the outside atmosphere.

Draft Booster. A power operated fan, blower, or other device installed in the chimney connector to increase the natural draft developed in the connected chimney.

Draft Regulator, Barometric. A device built into a fuel-burning appliance or made a part of a chimney connector or vent connector, which functions to reduce excessive draft through an appliance to a desired value by admitting ambient air into the appliance chimney, chimney connector, vent or vent connector.

4.02: continued

Fire Wall. *See* 780 CMR: *Massachusetts State Building Code.*

Flue Collar. That portion of an appliance designed for attachment of a chimney or vent connector or a draft hood.

Fuel Oil. Any hydrocarbon oil as specified by ASTM standard D396-90, Specification for Fuel Oils.

Furnace, Central Warm-Air. A self-contained indirect-fired or electrically heated appliance designed to supply heated air through ducts to spaces remote from or adjacent to the appliance location.

(a) Gravity-type Central Furnace. A central furnace depending primarily on circulation of air by gravity.

(b) Gravity-type Central Furnace with Integral Fan. A central furnace equipped with a fan as an integral part of its construction and operable on gravity systems only. The fan is used only to overcome the internal resistance to air flow.

(c) Gravity-type Central Furnace with Booster Fan. A central furnace equipped with a booster fan that does not materially restrict free circulation of air by gravity flow when such a fan is not in operation.

(d) Forced-Air-type Central Furnace. A central furnace equipped with a fan that provides the primary means for circulation of air.

1. Horizontal-type Central Furnace. A furnace designed with air flow through the furnace essentially in a horizontal path.
2. Upflow-type Central Furnace. A furnace designed with air flow essentially in a vertical path, discharging air at or near the top of the furnace.
3. Downflow-type Central Furnace. A furnace designed with air flow essentially in a vertical path, discharging air at or near the bottom of the furnace.

Furnace, Duct. A central furnace designed for installation in a duct of an air distribution system to supply warm air for heating and that depends for air circulation on a blower not furnished as part of the furnace.

Furnace, Floor. A self-contained indirect-fired or electrically heated furnace designed to be suspended from the floor of the space to be heated. A fuel-burning floor furnace is designed to take air for combustion from outside the space being heated and is provided with means for observing flame and lighting the appliance from such space.

Furnace, Stationary-type Industrial. A low-, medium- or high-heat appliance classified in accordance with its character and size and the temperatures developed in the portions thereof where substances or materials are heated for baking, drying, roasting, melting, vaporizing, or other purposes.

Gallon of Oil. The amount of oil that will occupy one standard U.S. Gallon (231 cubic inch) at a temperature of 60°F (16°C).

Gravity Feed Burner. A burner which receives its oil supply by static head due to elevation of the supply source.

Heat Reclaimer (Chimney Connector Type). A heat exchanger intended to be installed in a chimney connector, between a heating appliance and the chimney, to transfer heat from the flue gases through metal to air or water.

Heating and Cooking Appliance. An oil-fired appliance not intended for central heating. These appliances include kerosene stoves, oil stoves, and conversion range oil burners.

Indirect-Fired Appliance. A fuel-burning appliance in which products of combustion (flue gases) are not mixed in the appliance with the medium (*e.g.*, air) being heated.

4.02: continued

Installation. The complete setting-in-place, ready for operation of an oil burning appliance together with its accessories and equipment, or any change in an existing oil burner installation. (Note: Cleanings and nozzle, filter, pump, transformer or motor replacement are not considered installations.

International System of Units (SI Units). A universal, unified, self-consistent system of measurement units based on the MKS (meter, kilogram, second) system.

Kerosene Stove. A vented, self-contained, self-supporting kerosene burning range or room heater.

Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the state fire marshal and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed. Equipment or materials included in a list published by an organization acceptable to the marshal and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

> NOTE: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.

Marshal. The State Fire Marshal

Nationally Recognized Testing Laboratory. An organization which tests for safety and lists, labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00, Appendix C.

Oil Burner. A device for burning oil in heating appliances such as boilers, furnaces, water heaters, ranges, and the like. A burner of this type may be furnished with or without a primary safety control; and it may be a pressure atomizing gun type, a horizontal or vertical rotary type, or a mechanical or natural draft vaporizing type.

Oil Burner Installation. An oil burner of any type with electrical or mechanical operating and safety controls including its tank, piping, wiring, controls and related devices and including all oil burners, oil-fired units, and heating and cooking appliances.

Oil Burning Stove. A self-contained, free standing, above-the-floor indirect-fired appliance equipped with one or more oil burners. It may be equipped with an integral oil tank or may be designed for connection to a separate oil supply tank.

Oil-Fired Unit. An appliance equipped with one or more oil burners and all the necessary safety controls, electrical equipment and related equipment manufactured for assembly as a complete unit. This definition does not include kerosene stoves or oil stoves.

Oil Safety Valve. A listed device that:
(a) when installed at the supply tank in gravity feed oil systems, prevents the flow of oil should the supply line to the burner rupture or break;
(b) and protects the oil burner pump from input pressure exceeding three psi.

Permit. Any permit required by 527 CMR 4.00 and issued by the head of the fire department under the authority of M.G.L. c. 148, §§ 10A, 23, 24.

4.02: continued

Post Purge Control. An electrical control that is designed to allow the power venter or burner to operate after the burner flame has shut off, thus purging the vent system and heating appliance of combustion gases.

Power Venter. An electrically operated mechanical fan that is designed and listed to produce a negative draft at the heating appliance to exhaust combustion gases.

Pump, Automatic Oil. A pump, not an integral part of an oil burner, that automatically pumps oil from the supply tank and delivers the oil by gravity under a constant head to an oil-burning appliance. The pump is designed to stop pumping automatically in case of total breakage of the oil supply line between the pump and the appliance.

Pump, Oil Transfer. An oil pump, automatically or manually operated, that transfers oil through continuous piping from a supply tank to an oil-burning appliance or to an auxiliary tank, and that is not designed to stop pumping automatically in case of total breakage of the oil supply line between the pump and the appliance.

Range. An appliance intended primarily for cooking, including roasting, baking, or broiling or any combination of these functions.

Range Oil Burner. A gravity-feed sleeve-type oil burner having non-adjustable wicks designed for installation in a stove used primarily for cooking.

Readily Accessible. Capable of being reached easily and quickly for operation, maintenance, and inspection.

Room Heater. A self-contained, vented, free-standing air-heating appliance intended for installation in the space being heated and not intended for duct connection.

Room Heater, Circulating. A vented room heater with an outer jacket surrounding the heat exchanger arranged with openings at top and bottom so that air circulates between the heat exchanger and the outer jacket. Room heaters that have openings in an outer jacket to permit some direct radiation from the heat exchanger are classified as radiant type.

Room Heater, Radiant. A room heater designed to transfer heat primarily by direct radiation.

Secondary Safety Control. A normally closed thermally activated electrical control, designed to de-energize the burner control circuit and shut down the burner when a positive pressure occurs in the power vent system. This control shall be equipped with a manual reset device.

Shall. Indicates a mandatory requirement.

Sump. The receptacle employed with a vacuum tank.

Tank, Auxiliary. A tank having a capacity of not over 60 gallons (227 L) listed for installation in the supply piping between a burner and its main fuel supply tank. It may be included as an integral part of an automatic pump, or a transfer pump, or may be a separate tank.

Tank, Gravity. A supply tank from which the oil is delivered directly to the burner by gravity.

Tank, Integral. A tank that is furnished by the manufacturer as an integral part of an oil-burning appliance.

4.02: continued

Tank, Supply. A separate tank connected directly or by a pump to the oil-burning appliance.

Tank, Vacuum or Barometric. A tank not exceeding five-gallons (11-L) capacity, which maintains a definite level of oil in a sump or similar receptacle by barometric feed. Fuel is delivered from the sump to the burner by gravity.

Unconfined Space. Any space whose volume is equal to or greater than 50 cubic feet per 1,000 Btu/hr (4.8m^3 per kw) of the aggregate input rating of all fuel-burning appliances installed therein. Rooms connecting directly with the space in which the appliances are located by means of openings that have no doors or closures, unless fully louvered, shall be considered part of the unconfined space.

Unit Heater. A self-contained heating appliance, which may or may not include an integral fan for circulating air, which may be of the floor-mounted or suspended type, intended for the heating of the space in which it is installed. A unit heater may be an indirect-fired fuel-burning appliance, or may utilize steam, hot water, or electricity.

Valve, Manual Oil Shutoff. A manually operated valve in an oil line for the purpose of turning on or completely shutting off the oil supply to the burner.

Valve, Oil Control. An automatically or manually operated device consisting essentially of an oil valve for controlling the fuel supply to a burner.

(a) Metering (Regulating) Valve. An oil control valve for regulating burner input.

(b) Safety Valve. An automatic oil control valve of the "on" and "off" type (without any by-pass to the burner) that is actuated by a safety control or by an emergency device.

Vent Hood. A device which is part of the vent system that is designed to terminate combustion gases to the outside atmosphere.

Vent, Type L. A passageway, vertical or nearly so, composed of listed factory-built components assembled in accordance with the terms of listing for conveying flue gases from oil and gas appliances or their vent connectors to the outside atmosphere.

Wall Furnace. A self-contained, vented appliance complete with grills or equivalent, designed for incorporation in or permanent attachment to the structure of a building, mobile home, or recreational vehicle, and furnishing heated air directly into the space to be heated through openings in the casing.

Such appliances shall not be provided with duct extensions beyond the vertical and horizontal limits of the casing proper, except that boots, not to exceed ten inches (254 mm) beyond the horizontal of the casing, for extension through walls of nominal thickness, may be permitted.

When provided, such boots shall be supplied by the manufacturer as an integral part of the appliance. This definition excludes floor furnaces, unit heaters, and central furnaces.

Water Heater. An indirect-fired fuel burning or electrically heated appliance for heating water to a temperature not more than 200°F (93°C) having an input not greater than 200,000 Btu or 58.6 kw per hr and a water containing capacity not exceeding 120 U.S. gallons (454 L).

For additional definitions of terms relating to chimneys and heat-producing appliances, refer to 780 CMR: *Massachusetts State Building Code*.

4.03: General Requirements

(1) Approval of Oil Burner: Equipment, Permits and Certificates.

(a) Installation. All fuel oil burners and all equipment in connection therewith shall be installed and maintained in accordance with 527 CMR 4.00. Chimneys, connectors and power venters shall also be installed in accordance with 780 CMR: *Massachusetts State Building Code*.

4.03: continued

(b) Permits. Fuel oil in excess of ten gallons used in connection with an oil burner shall not be stored in or adjacent to any building or other structure without a permit. The head of the fire department may grant a temporary permit for the keeping and use of fuel oil under such terms as he may prescribe. A permit shall not be required for routine maintenance, such as the replacement of nozzles, ignition electrodes, or filters; however, a combustion performance test shall be conducted. [*See* Form 1]

No fuel oil burner shall be installed in any building or other structure without a permit first having been obtained from the head of the fire department. A combustion performance test is not required when tank replacement is the only work being conducted under a permit.

(c) Automatic Shut Off. Any fuel oil burner for which a competent attendant will not be CONSTANTLY on duty in the room where the burner is located, while the burner is in operation, shall be provided with an approved automatic means to prevent abnormal discharge of oil.

(d) Application to Install. No persons shall make an installation or alteration of any fuel oil burning equipment unless an application for a permit from the head of the fire department has been submitted. This form [*See* Form 1] shall be used by all fire departments throughout the Commonwealth. Electronic media storage is permissible.

The application form for such permit shall set forth the name of the owner or occupant of the building or other structure, the person or company who proposes to make the installation of such equipment and the address where such installation is to be made.

If an oil burner installation is made under emergency conditions, said application shall be made within 24 hours thereafter, excluding Saturdays, Sundays and holidays.

(e) Maximum Fuel Allowed Without a License. In accordance with the provisions of M.G.L. c. 148, § 13, as amended, the Board of Fire Prevention Regulations hereby prescribes 10,000 gallons of light fuel oil or 10,000 gallons of heavy fuel oil as the maximum amount of fuel oil that may be kept for use in a building or other structure without a license and registration or either of them, provided that a permit has been obtained and provided that the tank installation is in accordance with 527 CMR 4.00 and applicable rules of 527 CMR 9.00: *Tanks and Containers*.

(f) Certificate of Completion. The person or persons making the installation shall within 72 hours (excluding Saturday, Sunday and holidays) after test-firing the burner, file with the head of the fire department a certificate of completion on a form provided herein.

Upon receipt of such certification of completion, the head of the fire department shall make an inspection; if same is found to be in accordance with 527 CMR 4.00, the head of the fire department shall issue to the owner or occupant a permit for the keeping, storage and use of fuel oil in connection therewith, except where such storage is otherwise authorized by license; provided, however, that if such installation is found not be in accordance with 527 CMR 4.00, the permit shall be withheld and shall not be issued until the proper corrections have been made as directed. If after 30 days, an inspection is not conducted, the delivery of fuel oil shall not be prohibited for lack of a permit to store. [*See* Form 1]

(g) Certificate of Competency. (*See* M.G.L. c. 148, § 10D, and the applicable provisions of St. 1964, c. 680.) A person holding a certificate of competency as an oil burner technician may connect or disconnect for the purpose of repair or replacement, any device or control required by 527 CMR 4.00 to be part of an oil burner installation, or being an integral part of the oil burning equipment, at the connection on such device, control or part to be repaired or replaced, notwithstanding any contrary provision of M.G.L. c. 141.

Any person licensed as an electrician under M.G.L. c. 141 may do any electrical work in connection with the alteration, repair or installation of oil burning equipment without being certified as an oil burner technician.

(h) Exposure to Fire. If any oil tank, oil burner, oil burner control or wiring related to an oil burner has been exposed to fire and is suspected of being damaged, the entire installation shall be made inoperative by the head of the fire department who shall so notify the owner or occupant of the building or structure. Said installation shall not be operated until approved by the head of the fire department.

(i) Tank Removal. Unless otherwise provided for in 527 CMR 9.00, a permit shall be obtained from the head of the fire department for the removal of a fuel oil storage tank. Any person removing a fuel oil tank from inside a building for a purpose other than replacement or repair, shall remove or securely cap both ends of all fill and vent pipes previously connected to said tank.

4.03: continued

The Commonwealth of Massachusetts
Department of Public Safety

527 CMR 4.00 - Form 1

Application for Permit, Permit, and Certificate of completion for the Installation or Alteration of Fuel Oil Burning Equipment and the Storage of Fuel Oil

____
(City or Town) (Date)

Permit #'s: FD ________ Elec. ________ FDID#: ________ Fee Paid: ________

Owner/Occupant Name: ______________________ Tel #: ________

Installation Address: ______________________ Serviced Floor or Unit #: ________

☐ Heating Unit ☐ Domestic Water Heater ☐ Power Vent ☐ Other ________

Burner: ☐ New ☐ Existing Location: ______________________

Trade Name: ______________________ Mfg: ______________________

Type: ________ Model # or Size: ________ Nozzle Size: ________

☐ Fuel Oil ☐ Kerosene ☐ Waste oil

Storage Tank: ☐ New ☐ Existing Location: ______________________

Type: ________ Capacity: ________ gals. No. of Tanks: ________

Special requirements (or additional safety devices) ______________________

____

☐OSV Valve ☐Oil line protected ☐Sheet Rock ☐Sprinkler AFUE: ☐yes ☐no EF: ☐yes ☐no
(Furnace and boilers) (Water heater)

Co. Name: ______________________ Tel # ________

Address: ________ City: ________ Zip: ________

Completion Date: ________

Combustion Test: Gross Stack Temp.: ________ Net Stack Temp.: ________

CO^2 Test: ________ Breech Draft: ________

Smoke: ____ Overfire Draft: ________ Efficiency rating %: ________

I, the undersigned certify that the installation of fuel burning equipment has been made in accordance with M.G.L. c. 148 and 527 CMR 4.00 currently in effect. Furthermore, this installation has been tested in accordance with such requirements, is now in proper operating condition and complete instructions as to its use and maintenance have been furnished to the person for whom the installation (or alteration) was made.

Installer: ____
Print Name *Cert of C#* *Signature (no Stamp)*

Address: ______________________ City: ______________________

Once signed by the fire department, this is a PERMIT for the storage and use of oil burning equipment.

Approved by: ________________ Date: ________________

Keep Original as application. Issue duplicate as permit. This form may be photocopied..

4.03: continued

(2) Fuel Oil. The grade of fuel oil used for any fuel oil burner shall be one which tests and experience have been shown to be suitable for use with that burner, but in no case shall the grade of fuel oil be heavier than that for which the burner has been designed or adjusted.

(3) Gravity Feed to Burners. Gravity feed shall be used only with a burner arranged to prevent abnormal discharge of oil at the burner by automatic means specifically approved for the burner in which it is used.

(4) Fuel Oil Delivery.

(a) Fuel oil shall not be delivered to any storage tank unless the deliverer has knowledge that a permit has been obtained in accordance with 527 CMR 4.03(1)(b) and that such a permit is in effect at the time of delivery. Such knowledge may be considered to consist of any of the following:

1. Verification by the head of the fire department that such a permit is in effect.
2. Written verification from the owner or customer that the permit is either in his possession or is posted on the premises.
3. Observation that such a permit is in the possession of the owner or customer, or is posted on the premises.

(b) Fuel oil shall not be delivered to a storage tank by means of a pump or under pressure in any case where a tight connection is made between the discharge line and the tank inlet, unless such storage tank is designed to withstand the additional stress to which it may be subjected or unless the vent pipe for such tank is of sufficient size to relieve the tank of any undo pressure in excess of five psi. The delivery truck operator shall remain at the fill point during the entire operation.

(c) Fuel oil equal to the maximum capacity of the storage tank may be delivered without such a permit being in effect whenever an oil burner installation is first made provided that an application has been made in accordance with 527 CMR 4.03(1)(d).

(5) Tanks - General

(a) A tank for the keeping of fuel oil shall not be buried nor otherwise concealed inside or outside of any building or other structure until it has been inspected and approved by the head of the fire department.

(b) A supply tank larger than ten gallons (38 L) but not larger than 660 gallons (2500 L) shall meet the construction provisions of Standard UL 80, UL 2258 or be a secondary containment type tank meeting the following standards:

1. The primary tank shall meet the German Institute for Construction Technology (DIBt) Standard PA-VI-321, Requirements and Test Methods for Thermoplastic Tanks Made From Blow Molded Polyethylene, Rotationally Molded Polyethylene and Anionic Polymerization of Polyamide-6, or an equivalent standard.
2. The secondary containment shall be provided by a liquid tight outer jacket of galvanized steel or stainless steel with a minimum 18 gauge nominal thickness.
3. A means of detecting a leak from the primary tank into the secondary tank shall be provided.

(c) Supply tanks larger than 660 gallon capacity shall meet the provisions of Standard UL 142.

(d) A supply tank shall be of such size and shape that it can be installed in and removed from the building as a unit. Any person removing a fuel oil tank from inside a building for a purpose other than replacement or repair, shall remove all fill and vent pipes previously connected to said tank.

(e) A shutoff valve as described in 527 CMR 4.04(2)(i) shall be provided immediately adjacent to the burner supply connection at the bottom of a supply tank.

(f) A supply tank larger than ten-gallon capacity shall be provided with an open-vent pipe having a minimum 1¼ inches diameter and a fill pipe not larger than the diameter of the vent, both terminating outside the building. (*See* Table 4.03 1.)

4.03: continued

Table 4.03 1.

Aggregate Capacity of Tanks: U.S. Gallons	Diameter of
Vent Iron Pipe Size	
500 or less	1¼ in.
501 to 660	1½ in.
660 to 1320	1½ in.

For SI Units: 1 gal. = 3.785 L; 1 in. = 25.40mm

NOTE: Where tanks are filled by the use of a pump through tight connections, a vent pipe not smaller in size than the discharge of the pump should be used.

NON-TEXT PAGE

4.03: continued

(g) A supply tank provided with fill and vent pipes shall be equipped with a gaging device.

(h) Any unused opening in a tank equipped with fill and vent pipes shall be closed vapor-tight by a pipe plug or cap screwed up tightly.

(i) All fill and vent piping shall be standard cast iron, steel or brass pipe, with standard steel, malleable iron, cast iron or brass fittings. Plastic pipe and soldered copper tubing and fittings shall not be used for fill and vent piping.

(j) Cross connection of oil supply and return lines to two or more supply tanks to the same burner shall be acceptable and shall be made by a pipe no smaller than ½ inch iron pipe or ½ inch O.D. tubing.

(k) Two supply tanks may be provided with a single fill and a single vent provided:

1. The fill and vent pipes are not connected to the same tank,
2. The crossover pipe is a minimum two inch diameter with swing joints and a ground joint union,
3. The vent to the outside is a minimum two inch diameter.

(l) A supply tank shall be securely supported by rigid noncombustible supports to prevent settling, sliding, or lifting.

(6) Unenclosed Tanks: Installation Inside Buildings.

(a) A supply or storage tank located above the lowest story, cellar, or basement shall not exceed 60-gallon (227 L) capacity and the total capacity of tanks so located shall not exceed 60 gallons (227 L). Exception: Tanks located in attached grade level space with no usable space beneath it.

(b) A supply tank shall not be larger than 660 gallons. The aggregate capacity of any unenclosed tanks installed inside a building, or any portion of a building separated from another portion of a building by a fire separation, shall be 1320 gallons. The fire separation wall shall consist of two-hour rated fire resistive assemblies with opening protection and continuity in conformance with 780 CMR: *The Massachusetts Building Code*.

(c) An unenclosed supply tank not larger than ten gallons (38 L) shall be placed not less than two feet (0.6 m) horizontally from any source of heat either in or external to the appliance being served but in any case shall be located so that the temperature of the oil in the tank will not exceed 100°F (38°C).

(d) An unenclosed supply tank larger than ten gallons (38 L) shall be placed not less than five feet (1.5 m) from any fire or flame either in or external to any fuel-burning appliance, nor shall such a tank obstruct quick and safe access to any utility service meters, switch panels and shutoff valves.

(e) When a supply tank larger than ten-gallon (38 L) capacity is provided with an opening in the bottom for use as a burner supply connection or as a drain, the tank shall be pitched toward the opening with a slope of not less than ¼ inch per foot (6.35 mm per 0.3 m) of length.

(f) When tanks are installed inside garages or other areas subject to vehicular impact, physical barriers shall be provided. The physical barrier shall consist of lally columns, substantial pipes, bollards or similar barriers.

(7) Enclosed Tanks: Installation Inside Buildings.

(a) Individual supply tanks larger than 660 gallon capacity shall be enclosed. The enclosure shall consist of two-hour rated fire resistive assemblies with opening protection and continuity in conformance with 780 CMR: *The Massachusetts Building Code*.

(b) Each tank enclosure shall be provided with a noncombustible liquid tight sill or ramp at least six inches high. If the sill or ramp is more than six inches high, the walls to a height corresponding to the level of the oil that will be retained shall be built to withstand the lateral pressure due to the liquid head.

(c) Regardless of enclosure, a supply or storage tank located above the lowest story, cellar, or basement shall not exceed 60 gallon capacity, and the total capacity of tanks so located shall not exceed 60 gallons.

(d) Enclosed tanks shall be supported at least four inches above the floor by masonry saddles at least 12 inches thick, spaced not more than eight feet on centers and extending the full width of the tank. At least 15 inches clearance shall be provided between the tank and the top and walls of the tank enclosure for the purpose of inspection and repair.

4.03: continued

(e) All connections to an enclosed supply tank of more than 660 gallon capacity shall be made through the top of the tank, and the transfer of oil shall be by pump only and through continuous piping to and from the consuming appliance.

(8) Tanks: Installations Outside Buildings.

(a) Underground tanks and piping, individual aboveground tanks larger than 660 gallons capacity, more than two tanks at one location, or multiple tanks with an aggregate capacity over 660 gallons, shall meet the provisions of 527 CMR 9.00: *Tanks and Containers*.

(b) A supply tank larger than ten gallon capacity but not larger than 660 gallon capacity shall meet the construction provisions of Standard UL 80. Supply tanks of more than 660 gallon capacity shall meet the construction provision of Standard UL 142.

(c) For each oil burner installed in a building or other structure, a fuel oil tank of not more than 660 gallon capacity or two tanks of aggregate 660 gallon capacity may be located outside and adjacent to such building or structure provided the tank is suitably protected from physical damage incident to outside use and protected from atmospheric corrosion. Protection from atmospheric corrosion shall consist of at least one coat of organic alkyd resin type or asphalt base type paint on the exterior tank surface. If during transportation or installation the original protective coating has been damaged, these areas shall be recovered. The tank shall not block normal means of egress.

(d) Tanks installed outside of buildings shall be mounted on a continuous concrete slab at least four inches in depth and extending eight inches beyond the perimeter of the tank or tanks.

Tanks installed outside of buildings shall be securely supported by rigid non-combustible supports to prevent settling, sliding or lifting.

(9) Vent Piping.

(a) A supply tank shall be equipped with an open vent or an automatic operated vent, terminating outside the building. Vent openings and vent pipes shall be of ample size to prevent abnormal pressure in the tank during filling but not smaller than the pipe size specified in Table 4.03 1.

(b) Vent pipes shall be installed as to drain toward one tank without sags or traps in which liquid can collect. They shall be located so that they will not be subjected to physical damage. Vent pipes from tanks may be connected into one outlet pipe, The outlet pipe shall be at least as large as the largest individual vent pipe connected thereto. In no case shall the point of connection between two or more vent pipes be lower than the top of any fill pipe opening. The lower end of a vent pipe shall enter the tank through the top and shall extend into the tank not more than one inch (25 mm).

(c) Vent pipes shall terminate outside of buildings at a point not less than two feet (0.6m) measured vertically or horizontally from any building opening.

Outer ends of vent pipes shall terminate in a weatherproof vent cap or fitting or be provided with a weatherproof hood. All vent caps shall have a minimum free open area equal to the cross-sectional area of the vent pipe and shall not employ screens finer than four mesh. Vent pipes shall terminate at least three feet from grade to avoid being obstructed with snow and ice. Vent pipes from tanks containing heaters shall be extended to a location where oil vapors discharging from the vent will be readily diffused. If the static head with a vent pipe filled with oil exceeds ten psi (70 kPa), the tank shall be designed to withstand the maximum static head which will be imposed.

A fixed sash window shall not be considered an opening for the purpose of 527 CMR 4.03(9)(c).

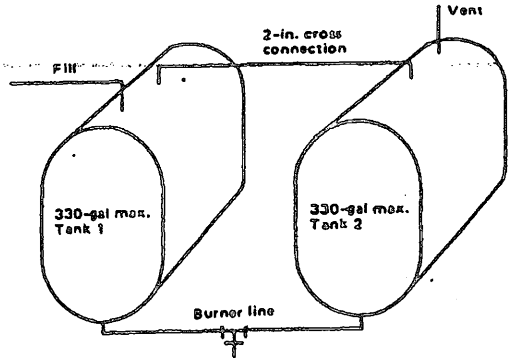
(d) Vent pipes shall not be cross-connected with pipes other than vent pipes.

1. Two supply tanks connected to the same burner shall be permitted to be cross-connected and provided with a single fill and a single vent, but when so connected they shall be on a common slab, at the same height, and rigidly secured, one to the other. (*See* Figures 4.03 1. and 2.)

4.03: continued

a. Recommended arrangement of two fuel tanks of not more than 660 gallons (2500 L) aggregate capacity.

Figure 4.03 1.



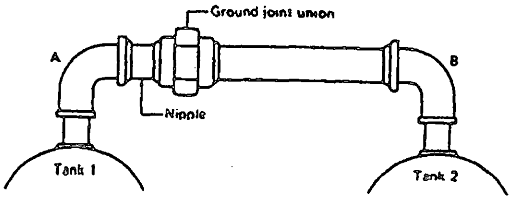
Recommended arrangement of two fuel oil tanks of not more than 660 gal (2500 L) aggregate capacity.

For SI Units: 1 gal. = 3.785 L; I in. = 25.4 mm.

In this arrangement of two tanks only one fill pipe and one vent pipe are used. During filling, oil enters Tank No. 1. The displaced vapors pass through the cross connection at top into Tank No.2. The expansion zone for both tanks is obviously in Tank No.2 until the tanks equalize after filling is completed.

b. This shows the detail of the cross connection that can be used in Figure 4.03 1.

Figure 4.03 2.



Swing joints (not shown) are normally used between A and B to permit tanks to settle with impairing the tightness of the pipe connections.

(10) Fill and Return Piping.

(a) A storage tank of more than 60 gallon capacity, other than an outside above-ground tank, shall be filled only through a fill pipe which terminates outside the building at a point at least two feet from any building opening at the same or lower level. A fixed sash window shall not be considered an opening for the purpose of 527 CMR 4.03(10). Fill pipes may pass through other than masonry walls provided the openings for such pipes are made oil-tight. A fill terminal shall be closed tight, when not in use, by a metal cover designed to prevent tampering; and shall be properly identified as a fuel oil fill terminal by an approved metal plate or tag or other permanent device.

When a tank contains a heater, the tank end of the fill pipe shall be sealed by a trap or shall be extended to a point below the lower end of the suction pipe.

(b) A return line from a burner or pump to a supply tank shall enter the top of the tank.

4.03: continued

(c) Cross connections of fill piping between two supply tanks shall not exceed 660-gallon (2,500-L.) aggregate capacity.
(d) An auxiliary tank shall be filled by a pump transferring the oil through continuous piping from the supply tank.
(e) An auxiliary tank shall be located at a level above the top of the supply tank from which it is filled.
(f) An auxiliary tank shall be provided with an overflow pipe draining to the supply tank and extending into the top of the supply tank not more than one inch (25 mm). This requirement does not apply to an auxiliary tank specifically listed for use without an overflow pipe.
(g) An overflow pipe from an auxiliary tank and a return line from a burner or pump shall have no valves or obstructions.

(11) Oil Gauging.
(a) All storage tanks in which a constant oil level is not maintained by an automatic pump shall be equipped with a method of determining the oil level.
(b) Test wells shall not be installed inside buildings. For outside service they shall be equipped with a tight metal cover designed to discourage tampering.
(c) Gaging devices such as liquid level indicators or signals shall be designed and installed so that oil or vapor will not be discharged into a building from the fuel supply system. Inside tanks provided with fill and vent pipes used for No. 1 or No. 2 fuel oil shall be provided with a device to indicate either visually or audibly at the fill point when the oil in the tank has reached a predetermined safe level.
(d) No tank used in connection with any oil burner shall be equipped with a glass gage or any gage which, when broken, will permit the escape of oil from the tank.

4.04: Oil Burners, Light Fuel Oil Type

(1) Oil Supply and Return Lines.
(a) All oil supply and return lines between the oil supply tank and the oil burner shall be standard cast iron, steel or brass pipe, or copper tubing, with standard steel, malleable iron, cast iron, brass or copper fittings. Exception: Tanks and piping subject to the provisions of 527 CMR 9.00: *Tanks and Containers.*
(b) Listed flexible hose shall be permitted to be used to reduce the effects of jarring and vibration or where rigid connections are impractical, and shall be installed in full compliance with its listing.
(c) All threaded joints and connections shall be made tight with suitable lubricant or pipe compound. Teflon tape shall not be used. Unions requiring gaskets or packings, right or left couplings, and sweat fittings employing solder having a melting point of less than 500°F (260°C) shall not be used in oil lines. Compression type fittings shall not be used.
Exception: Mechanical connections on tubing of the flare type or gaugeable, two ferrule, swage type fittings are acceptable.
(d) Piping used in the installation of oil burners and appliances other than conversion range oil burners shall be not smaller than ⅜-inch iron pipe size or ⅜-OD tubing except that ¼-inch pipe or 5/16-OD tubing may be used in the suction line of systems where the top of the tank is below the level of the oil pump. Copper tubing shall have 0.035-inch nominal and 0.032-inch minimum wall thicknesses.
(e) Oil supply lines shall be rigidly secured in place and protected from injury and shall be protected against corrosion. All new oil supply lines in direct contact with concrete or earth shall be enclosed with a continuous non-metallic sleeve that extends out of the concrete or earth a minimum of four inches on each end.

On existing installations, whenever a burner, boiler, furnace or tank is replaced, the oil supply line shall either be replaced and enclosed with a continuous sleeve as for new installations or a listed oil safety valve shall be installed at the tank end of the oil supply line in accordance with the manufacturer's instructions.

An oil safety valve and continuous non-metallic sleeve is not required when the burner is located above the oil supply tank and the entire oil supply line is connected to, and above the top of the tank.

4.04: continued

Nothing in 527 CMR 4.00 shall prohibit overhead installation of oil supply and return lines or cross connection of oil supply lines from multiple tanks.

(f) Oil supply lines and return lines to tanks exposed to freezing temperatures shall be connected to the top of the tank. 527 CMR 4.04(1)(f) shall not apply to gravity feed oil burners using #1 fuel oil, range oil or kerosene.

(g) Oil supply lines shall be properly reamed; joints and connections shall be made oil tight; and in no case shall any joint or connection be concealed with a wall, partition or floor.

(h) Proper allowance shall be made for expansion, contraction, jarring and vibration. Pipe lines, other than tubing connected to underground tanks, shall be provided with double swing joints or flexible connectors, or otherwise arranged to permit the tanks to settle without impairing the tightness of the pipe connections.

(i) Piping systems shall be maintained liquid tight. A piping system that has leaks shall be emptied of liquid and repaired.

(j) The oil supply line to a burner shall be provided with a listed filter assembly. 527 CMR 4.04(1)(j) shall not apply to gravity feed oil burners.

(2) Oil Pumps and Valves.

(a) Where oil is supplied to a burner requiring gravity feed and a constant level valve is not incorporated in the burner assembly or in an auxiliary tank used in connection with an automatic pump, an approved constant level valve shall be installed in the oil feed line as close to the burner as practicable, to insure uniform delivery of oil to the burner.

Unless the constant level valve is equipped with an anti-flooding device it shall be provided with a vent line carried to a point higher than the top of the supply tank and terminated with a return bend.

(b) An oil pump not a part of a burner shall be a positive displacement type that automatically shuts off the oil supply when stopped.

(c) An automatic pump not, an integral part of a burner shall be a listed type installed in full compliance with its listing.

(d) A readily accessible manual shutoff valve as described in 527 CMR 4.04(2)(i) shall be installed at each point where required to properly control the flow of fuel in normal operation and where required to avoid oil spillage during servicing. The valve shall be installed to close against the supply.

(e) Where a shutoff is installed in the discharge line of an oil pump not an integral part of a burner, a pressure relief valve shall be connected into the discharge line between the pump and the shutoff valve and arranged to return surplus oil to the supply tank or to bypass it around the pump, unless the pump includes an internal bypass.

(f) Any fuel oil line incorporating a heater shall be provided with a relief valve arranged to discharge to the return line when any valve, pump, or other device may prevent the release of excessive pressure because of the expansion of the oil when heated.

(g) Where oil is supplied to a burner requiring uniform flow by gravity feed and a constant level valve is not incorporated in the burner assembly or the oil is not supplied by an automatic pump, a constant level valve shall be installed in the supply line at the gravity tank or as close thereto as practicable, to ensure uniform delivery of oil to the burner.

The vent opening of such constant level valve shall be connected by piping or tubing to the outside of the building, unless the constant level valve is provided with an anti-flooding device. Vent piping or tubing of constant level valves shall not be connected to tanks or tank vents.

(h) Provision shall be made for adequate ventilation of enclosures, such as vaults or pits, where pumps and accessories are installed prior to entering for inspection or repair.

(i) Readily accessible hand-operated, fusible, springloaded valves of an approved automatic type shall be installed in the oil supply line, one near each burner and one close to each supply tank so as to automatically stop the flow of oil in case of fire.

4.04: continued

(3) Oil Burner Controls.

(a) Oil burning equipment shall be provided with a means for manually stopping the flow of oil to the burner. Said means shall be at a convenient and safe location.

This shall be accomplished by the installation of a quick-closing ¼ turn valve in the oil supply line or by means of an electrical switch in the burner electrical circuit.

The valve or switch shall be plainly marked to indicate its purpose and placed outside the entrance to the room where the burner is located or outside of the cellar/basement door at first floor level in an exposed location clearly visible and readily accessible at all times.

(b) An automatic operated oil burner used in connection with a hot water, steam or warm air heating system shall be equipped with an approved controller that will shut down the burner in the event of abnormal pressure in the steam boiler or overheating within the hot water boiler or warm air furnace.

This controller, acting as a limit safety, shall be in addition to and separate from the regular operating control of the burner, and shall be connected into the burner supply circuit.

(c) If a gas pilot is used for ignition, pilot flame must be proven in 15 seconds or less and before oil can be delivered to the burner. Each gas pilot line shall be installed in accordance with 248 CMR 2.00: *Uniform State Plumbing Code and Massachusetts Fuel Gas Code.*

1. Each fully automatic oil burner having a firing rate of three gallons or less per hour shall be equipped with a type of approved primary safety control which shall shut off the oil supply to the burner within 45 seconds if ignition is not established or in the event of flame failure after combustion has been established.

2. Each fully automatic oil burner having a firing rate of more than three gallons per hour but not more than 20 gallons per hour shall be equipped with a type of approved primary safety control which shall provide a trial for main flame ignition period of not more than 15 seconds.

Once combustion is established and in the event of flame failure, the oil supply shall be shut off to the burner within three seconds nominal, except a flame failure reaction time of more than three seconds but not more than 15 seconds is permitted if intermittent (Commonly called constant ignition) is employed, or if the ignition is re-energized in not more than 0.8 seconds after flame extinguishment occurs.

3. Each fully automatic oil burner having a starting firing rate over 20 gallons per hour shall be provided with a proven source of ignition. The pilot verification control shall prove the presence of an adequately sized and positioned ignitor to safely and smoothly ignite the main fuel prior to allowing the main fuel valve to open.

The time for trial for pilot proving shall be limited to a maximum of 15 seconds. The time for trial for main flame ignition shall be limited to a maximum of 60 seconds. In the event of a flame failure once combustion is established, the oil supply shall be shut off to the burner within three seconds nominal.

4. Each fully automatic oil burner having a firing rate of over 20 gallons per hour, but equipped to provide an initial proven firing rate of more than seven gallons per hour and not more than 20 gallons per hour shall be equipped with a flame verification control which shall provide a trial for ignition of not more than 15 seconds after the oil valve opens.

The burner may increase to maximum firing rate after the main flame is proven. In the event of flame failure once combustion is established the oil supply shall be cut off to the burner within three seconds nominal.

5. The flame verification primary control shall include a safe start circuit to prevent initiation of the ignition cycle in the event of a component failure in the flame verification primary circuit and flame detector. In addition the flame verification primary control used on any burner with a firing rate of more than 20 gallons per hour shall include provisions for a continuous circuit component check of the flame verification primary circuit and the flame detector throughout the flame proving period. (The continuous circuit component check requirement shall apply to all new installations and took effect January 1, 1970.)

4.04: continued

6. Each fully automatic oil burner having a firing rate of over 20 gallons per hour, but equipped to provide an initial proven firing rate of not more than seven gallons per hour shall be equipped with a flame verification control which shall provide a trial for ignition of not more than 30 seconds.

The burner may increase its maximum firing rate after the main flame is proven. In the event of flame failure once combustion is established, the oil supply shall be shut off to the burner within three seconds nominal.

7. A burner which requires a separate power operated louver, fan, or blower to supply air for combustion shall be equipped with an approved combustion air supervisory switch to interrupt burner operation on loss of adequate air for combustion.

8. When used with burners induced and/or forced draft fans shall be electrically interlocked with motor starters of burner motors to prevent the burner operation when draft fans are not operating.

(d) When a steam boiler is equipped with an oil burner, it shall be equipped with an approved low-water cut-off that will shut off the power supply to any automatic oil burner in the event of low water. Said cut-off shall be connected into the main burner supply circuit.

(e) Each automatically fired hot water heating boiler with heat input greater than 400,000 Btu per hour shall have an automatic low water fuel cut-off which has been designed for hot water service, so located as to automatically cut off the fuel supply when the surface of the water falls to the lowest safe permissible water level established by the boiler manufacturer.

(4) Electric Wiring and Equipment.

(a) A person holding a certificate of competency as an oil burner technician may connect or disconnect for the purpose of installation, alteration, repair or replacement, any device, wiring or control required by 527 CMR 4.00 to be part of an oil burner installation, or being an integral part of the oil burning equipment, at the connection on such device, wiring control or part to be replaced, from the thermal disconnect to the oil burning appliance. All electrical wiring shall be in accordance with 527 CMR 12.00: *Massachusetts Electrical Code.*

(b) Oil burners electrically controlled, driven and/or operated shall be supplied from a separate branch circuit located at the service disconnect panel, or at branch circuit sub-panel. This circuit shall be clearly marked for the equipment it controls.

All protective, control and emergency devices shall be series-connected from the electrical distribution panel, through the emergency switch, through the thermal switch, to the service switch in the un-grounded line conductors. The burner controls shall be installed in the un-grounded supply conductors of the circuit and shall not exceed 150 volts to ground.

(c) A control (service switch) to start and stop a light fuel oil burner shall be installed at a location where the operator can view the fire. The switch shall be located at a maximum of three feet from the burner.

(d) Where a stack relay control is used, it shall be so installed that it can be readily removed from the stack mounting flange for inspection of the metallic element without disconnecting the wiring.

(e) An electrical thermal switch fused to break the ungrounded conductor in the main circuit at 165°F, shall be installed in the main power line within six feet over the top of the burner-boiler or burner-furnace.

If the ceiling above the burner-boiler or burner-furnace exceeds 12 feet in height, an additional thermal switch shall be installed on the ceiling and connected in series with the lower switch.

(f) Electrical equipment shall not obstruct clear access to clean out and service panels.

(5) Installation of Indoor Appliances.

(a) An oil burner shall be installed by a person having a certificate of competency in accordance with M.G.L. c. 148, § 10C or directly supervised by or in the presence of a person having a certificate of competency and in accordance with the instructions of the manufacturer of all equipment made part of the oil burner installation.

4.04: continued

(b) All piping, fittings, connections and tanks shall be tight and free from oil leaks.

(c) Before installing or remodeling any oil-burning equipment for commercial or industrial applications, plans or sketches showing the relative location of burners, tanks, pumps, piping, and elevations of buildings and their lowest floors or pits, relating to the proposed installation or alteration, shall be submitted to the head of the fire department upon request.

(d) The installation shall be made in accordance with the instructions of the manufacturer.

Such instructions shall include directions and information as deemed by the manufacturer to be adequate for attaining proper and safe installation, maintenance, and use of the appliance. These instructions shall be left with the owner.

(e) The installation shall be such as to provide reasonable accessibility for cleaning heating surfaces, removing burners, replacing motors, controls, air filters, draft regulators, and other working parts, and for adjusting, cleaning, and lubricating parts requiring such attention.

(f) Oil-burning appliances shall be installed only in locations where combustible dusts and flammable gases or vapors are not normally present.

1. Combustible construction within five feet of and directly over an oil fired boiler or furnace shall be protected with noncombustible material of at least one hour fire resistive rating. Such overhead protection shall extend four feet in all directions from the top center of the boiler or furnace but in no case less than two feet beyond the perimeter of said replacement of existing boilers, furnaces, and domestic hot water heaters other than electric hot water heaters and gas-fired installations.
2. In lieu of noncombustible material of at least one hour fire resistive rating, a high temperature (250 to 300°F) rated, pendent, automatic sprinkler supplied from the domestic cold water supply over the center of the furnace or boiler, shall be acceptable. It shall have a "K" factor between 2.5 and 4.0 (reduced orifice), and the water supply shall be capable of supplying at least ten gallons per minute (GPM) at a residual pressure of seven pounds per square inch (PSI) at the location of the sprinkler for ten minutes. The installation of an automatic sprinkler shall be made in accordance with 248 CMR: *Massachusetts Plumbing and Gas Code*.

Exception: 527 CMR 4.04(5)(f)1. and 2. shall not apply to new installations or replacement of existing boilers or furnaces that have an A.F.U.E. (Annual Fuel Utilization Efficiency) rating or domestic hot water heaters that have an EF (Energy Factor) rating in accordance with standards of the United States Department of Energy (D.O.E.).

(g) After installation of the oil-burning equipment, operation and combustion performance tests shall be conducted to make certain that the burner is operating in a safe and acceptable manner and that all controls and safety devices function properly.

(h) Contractors installing industrial oil-burning systems shall furnish diagrams to the owner/occupant showing the main oil lines and controlling valves.

(i) A boiler or furnace in which an oil burner is installed shall be connected by a connector pipe to a chimney flue which has sufficient draft to assure safe operation of the burner. Each section of connector pipe shall be mechanically secured.

(j) An approved automatic draft control is required for light fuel oil burners, except where the equipment is so designed as to otherwise control the draft.

(k) A combustion chamber shall be constructed in accordance with the specifications of the oil burner manufacturer and the boiler or furnace manufacturer.

(l) Safety performance tests shall be conducted where more than one burner is installed in a single combustion chamber or where a single burner has more than one firing head in order to make sure that the automatic device for preventing abnormal discharge of oil at the burners or burner will function properly in the event of failure of one of more units to ignite on starting or in the event of flame extinguishment of one or more units during operation.

(m) Air for Combustion and Ventilation - General

1. Appliances shall be installed in a location in which the facilities for ventilation permit satisfactory combustion of oil, proper venting, and the maintenance of ambient temperature at safe limits under normal conditions of use.

4.04: continued

Appliances shall be located in such a manner as not to interfere with proper circulation of air within the confined space. When buildings are so tight that normal infiltration does not meet air requirements, outside air shall be introduced. Ducts used to convey air from the outdoors shall be of the same cross-sectional area as the free area of the openings to which they connect. The minimum dimension of rectangular air ducts shall be not less than three in. (76 mm). Whenever an oil appliance is used in a sealed combustion application, the air inlet and vent outlet shall be on the same surface wall.

2. For residence-type installations and similar usages, the requirements of 527 CMR 4.04(5)(m)1. normally may be obtained by application of one of the methods covered in 527 CMR 4.04(5)(n)1. through 3.

3. For installations of commercial and industrial equipment see 527 CMR 4.04(5)(n)6.

(n) Confined and Unconfined Spaces

1. Air for combustion shall be provided in the following manner:

a. Through a pipe or duct connected to a suitable air intake hood located outside and connected directly to the air inlet of the burner. A suitable relief shall be provided to allow air to flow to the burner should the outside air inlet be blocked.

b. Through a pipe or duct connected to a suitable air intake hood located outside and connected directly to the oil burner enclosure of a furnace or boiler.

c. Through a pipe or duct connected to a suitable air intake hood located outside and connected to a enclosed vent damper located next to the burner or burners. The damper shall be closed when the burner is not operating and opened when the burner is operating. The vent damper shall be wired in the burner circuit so as to prevent the burner from operating should the damper be in a closed position.

d. The size of the pipe or duct used for combustion air shall be of sufficient size to satisfy the combustion air requirements of the burner manufacturer.

2. Ventilation Air Unconfined Spaces.

a. In unconfined spaces in buildings of conventional frame, brick or stone construction, infiltration normally is adequate to provide air for ventilation.

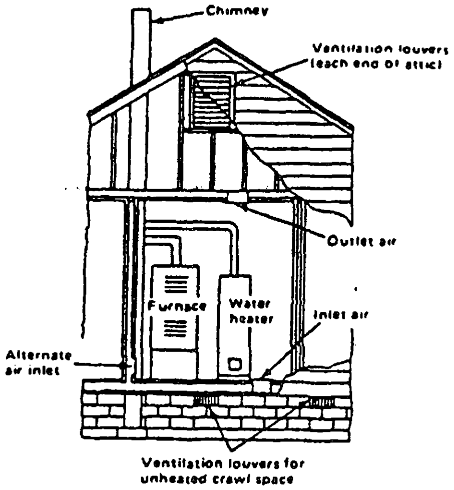
b. If the unconfined space is within a building having insufficient air because of tight construction, the air for ventilation shall be obtained from outdoors or from spaces freely communicating with the outdoors. Under these conditions a permanent opening or openings having a total free area of not less than one square inch per 5,000 Btu per hour (28 sq. in. per gal. per hr.) of total input rating of all appliances shall be provided.

3. Ventilation Air Confined Spaces.

a. All Air from Inside Building. The confined space shall be provided with two permanent openings, one near the top of the enclosure and one near the bottom. Each opening shall have a free area of not less than one square inch per 1,000 Btu per hour (140 sq. in. per gal. per hr.) of the total input rating of all appliances in the enclosure freely communicating with interior areas having in turn adequate infiltration from the outside. [*See* Figure 4.04 1.]

4.04: continued

Figure 4.04 1.


Chimney
Ventilation louvers (each end of attic)
Outlet air
Furnace
Water heater
Inlet air
Alternate air inlet
Ventilation louvers for unheated crawl space

Note: The inlet and outlet air openings shall each have a free area of not less than 1 sq in. per 4000 Btu per hr (35 sq in. per gal per hr) of the total input rating of all appliances in the enclosure.

Appliances located in confined spaces. All air from outdoors; inlet air from ventilated crawl space and outlet air to ventilated attic.

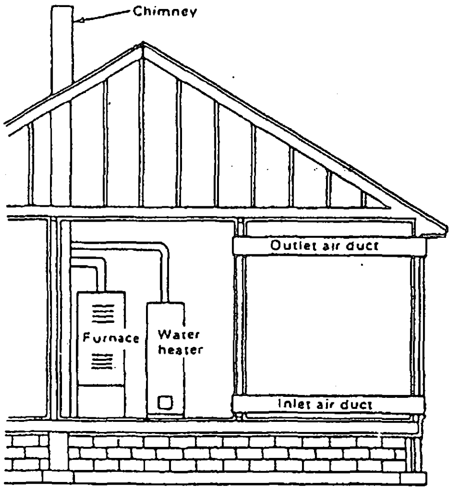
b. When there is insufficient air for ventilation in the confined space and the freely communicating interior area air for proper ventilation, air shall be supplied in one of the following ways:

i. The enclosure shall be provided with two openings for ventilation located and sized as described in 527 CMR 4.04(5)(n)3.a. In addition, there shall be one opening directly communicating with outdoors or to such spaces (crawl or attic) that freely communicate with outdoors. This opening shall have a free area of not less than one square inch per 10,000 Btu per hour (14 sq. in. per gal. per hr.) of all appliances in the enclosure.

ii. The confined space shall be provided with two permanent openings, one in or near the top of the enclosure and one in or near the bottom. The openings shall communicate directly, or by means of ducts, with outdoors or to such spaces (crawl or attic) that freely communicate with outdoors. [*See* Figures 4.04 2. and 3.]

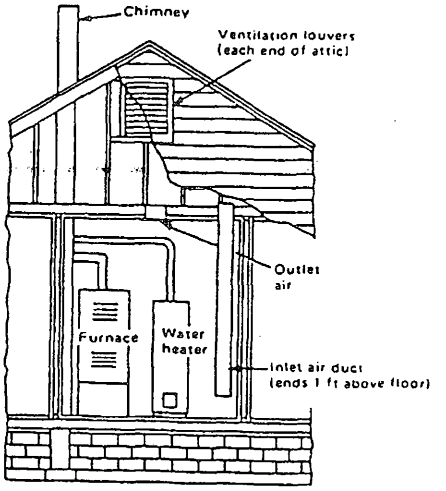
4.04: continued

Figures 4.04 2. and 3.



Note. Each air duct opening shall have a free area of not less than 1 sq in. per 2000 Btu per hr (70 sq in. per gal per hr) of the total input rating of all appliances in the enclosure.

Appliances located in confined spaces — all air from outdoors.


Chimney
Ventilation louvers (each end of attic)
Outlet air
Furnace
Water heater
Inlet air duct (ends 1 ft above floor)

Note: The inlet and outlet air openings shall each have a free area of not less than 1 sq in. per 4000 Btu per hr (35 sq in. per gal per hr) of the total input rating of all appliances in the enclosure.

Appliances located in confined spaces — all air from outdoors through ventilated attic.

When directly communicating with outdoors or by means of vertical ducts, each opening shall have a free area of not less than one square inch per 4,000 Btu per hour (35 sq. in. per gal. per hr.) of total input rating of all appliances in the enclosure. If horizontal ducts are used, each opening shall have a free area of not less than one square inch per 2,000 Btu per hour (70 sq. in. per gal. per hr.) of total input of all appliances in the enclosure.

4. Louvers and Grilles. In calculating free area in 527 CMR 4.04(5)(n)1., 2., 3. and 6., consideration shall be given to the blocking effect of louvers, grilles, or screens protecting openings. Screens used shall not be smaller than ¼ inch (6.3 mm) mesh and shall be readily accessible for cleaning.

If the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. If the design and free area is not known, it may be assumed that wood louvers will have 20-25% free area and metal louvers and grilles will have 60-75% free area.

5. Special Conditions. Where an appliance is installed in a location in which the operation of exhaust fans, kitchen ventilation systems, clothes dryers, or fireplaces may create conditions of unsatisfactory combustion or venting, special provisions shall be made subject to the approval of the head of the fire department.

6. Combustion Air. For commercial and industrial equipment, permanent facilities for supplying an ample amount of outside air shall be provided in accordance with the following:

a. For furnace or boiler rooms adjacent to outside walls, and where combustion air is provided by natural ventilation from the outside, there shall be a permanent air supply inlet having a total free area of not less than one square inch per 4,000 Btu per hour (35 sq. in. per gal. per hr.) (5.5 cm^2 per kw) of total input rating of the burner or burners and in no case less than 35 sqare inch (0.425 m^2).

b. For furnace or boiler rooms not adjacent to outside walls, the combustion air shall be supplied in a manner acceptable to the head of the fire department.

7. Specially Engineered Installations. The size of air openings shall not necessarily govern when special engineering methods designed and certified by a Massachusetts registered professional engineer assure an adequate supply of air for combustion and ventilation.

4.04: *continued*

(o) Requirements for Specific Appliances (Clearances, Mounting, etc.).

1. Boilers, Furnaces, Floor-Mounted Unit Heaters, and Water Heaters. Appliances in rooms shall be installed with the clearances from combustible material not less than as indicated in Figure 4.04 4. and Table 4.04 1., except that appliances specifically listed for installation at lesser clearance may be installed in accordance with their listing. In no case shall the clearance be such as to interfere with the requirements for combustion air and accessibility.

Figure 4.04 4.

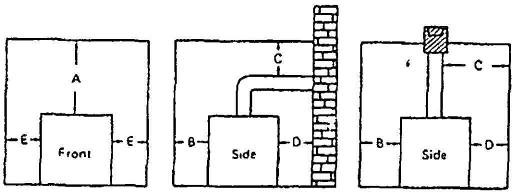


Table 4.04 1.

Classification as to Type of Appliance	Clearances, in.				
	A Above^1	B Front	C Chimney Con-nector^4	D Rear	E Sides
Form I	2^2	24	18	6	6
Form II^3	6	24	18	6	6
Form III	18	48	18	18	18
Form IV	18	96	36	36	36
Form V^3	5	24	18	18	18

For SI Units: one in. = 25 mm; one ft. = 0.3048 m.

NOTE 1: This column indicates clearances above the top of the appliance or above the top and from the sides of furnace bonnet or plenum.
NOTE 2: This clearance may be reduced to one inch (25 mm) for a listed, forced air or gravity system equipped with a limit control that cannot be set higher than 200°F
NOTE 3: The clearance from the bottom of a suspended furnace or unit heater to combustible material shall be not less than 18 inches (0.5 mm).
NOTE: *See* 527 CMR 4.04(9)(b) for installation of chimney connectors.

Description of Classifications - Refer to Table
Form I. Automatically fired warm-air furnaces, except horizontal types, and floor-mounted unit heaters equipped with approved limit controls that cannot be set higher than 250°F (121°C), not larger than 100 cubic feet in size (excluding blower compartments and burner equipment).
Form II. Horizontal-type warm-air furnaces, and water-wall-type heating boilers operating at not in excess of 250°F (121°C) for water boilers and at not over 15 psig pressure for steam boilers, and water heaters, not larger than 100 cubic feet in size (excluding burner equipment and blower compartments of furnaces).
Form III. Low-heat appliances, which include steam boilers operating at not more than 50 psig pressure, or not larger than ten boiler horsepower regardless of operating pressure, and boilers, furnaces except floor furnaces, and heaters not classified under Forms I, II, IV, and V.

4.04: continued

Form IV. Medium-heat appliances, which include steam boilers other than as classified above.
Form V. Suspended-type unit heaters not more than 100 cubic feet in size (excluding fan and burner equipment).

2. Appliances shall be permitted to be installed in rooms, but not in alcoves or closets, with lesser clearances to combustible material, provided the combustible material or appliance is protected as described in Table 4.04 2. and Figures 4.04 5., 6. and 7.

Table 4.04 2.

Reduction of Clearances with Specified Forms of Protection

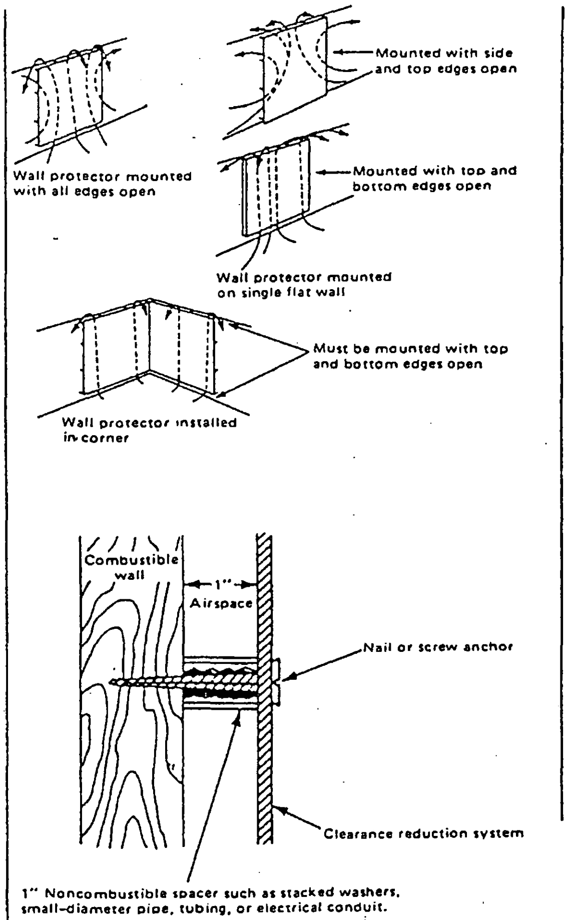
	Where the required clearance with no protection from appliance connector is:									
Type of Protection	36 inches		18 inches		12 inches		9 inches		6 inches	
	Allowable Clearance with Specified Protection (inches)									
Applied to and covering all surfaces of combustible material within the distance specified as the required clearance with no protection.	Above	Sides & Rear	Above	Sides & Rear	Above	Sides & Rear	Above	Sides & Rear	Above	Sides & Rear
(a) 3½-in. thick masonry wall without ventilated air space	-	24	-	12	-	9	-	6	-	5
(b) ½-in. insulation board over 1-in. glass fiber or mineral wool batts	24	18	12	9	9	6	6	5	4	3
(c) 0.024 (24-gauge) sheet metal over 1 in. glass fiber mineral wool batts reinforced with wire on rear face with ventilated air space	18	12	9	6	6	4	5	3	3	3
(d) 3½in.-thick masonry wall with ventilated air space	-	12	-	6	-	6	-	6	-	6
(e) 0.024 (24-gauge) sheet metal with ventilated air space	18	12	9	6	6	4	5	3	3	2
(f) ½in.-thick insulation board with ventilated air space	18	12	9	6	6	4	5	3	3	3
(g) 0.024 (24-gauge) sheet metal with ventilated air space over 0.024 (24-gauge) sheet metal with ventilated air space	18	12	9	6	6	4	5	3	3	3
(h) 1-in. glass fiber or mineral wool batts sandwiched between 2 sheets 0.024 (24-gauge) sheet metal with ventilated air space	18	12	9	6	6	4	5	3	3	3

Notes

1. Reduction of clearances from combustible materials shall not interfere with combustion air, draft regulators, and accessibility for servicing.
2. All clearances shall be measured from the outer surface of the combustible material to the nearest point on the surface of the appliance or connector, disregarding any intervening protection applied to the combustible material.
3. Spacers and ties shall be of noncombustible material. No spacer or tie shall be used directly opposite an appliance or connector.
4. With all the clearance reduction systems using ventilated air space, adequate provision for air circulation shall be provided as described. *See* Figures 4.04(5)(o)2.b. and c.
5. There shall be at least 1 inch (25 mm) clearance between the reduction system and combustible walls and ceilings for reduction systems using ventilated air space.
6. If a wall protector is mounted on a single flat wall away from corners, adequate air circulation may be provided by leaving only the bottom and top edges, or only the side and top edges open, with at least one inch (25 mm) air gap.
7. Mineral wool batts (blanket or board) shall have a minimum density of eight lb/ft^3(128 kg/m^3) and a minimum melting point of 1500°F (816°C).
8. Insulation material used as part of a clearance reduction system shall have a thermal conductivity of 1.0 (Btu-in)(sq ft-hr-°F) or less.
9. There shall be at least one inch (25 mm) between the appliance or connector and the protector. In no case shall the clearance between the appliance or connector and the combustible material be reduced below that allowed in the table.
10. All clearances and thicknesses are minimum. Larger clearances and thicknesses are acceptable.

4.04: continued

Figure 4.04 5.

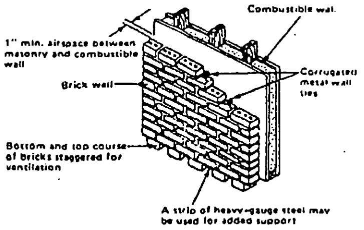

Mounted with side and top edges open
Wall protector mounted with all edges open
Mounted with top and bottom edges open
Wall protector mounted on single flat wall
Must be mounted with top and bottom edges open
Wall protector installed in corner
Combustible wall
1"
Airspace
Nail or screw anchor
Clearance reduction system
1" Noncombustible spacer such as stacked washers, small-diameter pipe, tubing, or electrical conduit.

Masonry walls may be attached to combustible walls using wall ties.

Do not use spacers directly behind appliance or connector.

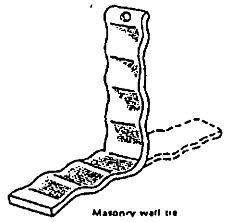
Wall protector clearance reduction system.

Figure 4.04 6.


Combustible wall
1" min. airspace between masonry and combustible wall
Brick wall
Corrugated metal wall ties
Bottom and top course of bricks staggered for ventilation
A strip of heavy-gauge steel may be used for added support

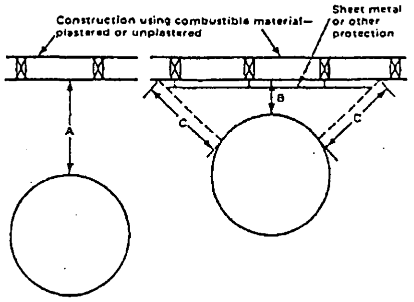
Note: Do not place masonry wall ties directly behind appliance or connector

Masonry clearance reduction system



Masonry clearance reduction system.

Figure 4.04 7


Construction using combustible material—plastered or unplastered
Sheet metal or other protection
A
B
C
C

Extent of protection necessary to reduce clearances from appliances or chimney connectors.

Appliance or Connector

"A" equals the required clearance with no protection, specified in Table 1-4.1(b).

"B" equals the reduced clearance permitted. The protection applied to combustible materials is required to extend far enough in each direction to make "C" equal "A." Plastered constructions having combustible supports are classed as combustible regardless of the type of lath.

3. Floor-mounted appliances shall be placed on the ground, or on floors of fire-resistive construction with noncombustible flooring or surface finish and with no combustible material against the underside thereof, or on fire-resistive slabs or arches having no combustible material against the underside thereof. Such construction shall extend not less than 12 inch (0.3 m) beyond the appliance on all sides.

4. Appliances listed specifically for installation on a floor constructed of combustible material may be placed in accordance with the conditions of such listing.

5. Appliances shall be permitted to be placed on combustible floors although not listed for such installation, provided the floor under the appliance is protected in accordance with the requirements of accepted building code practice. An appliance listed for installation under Form I or II in Table 4.04 1. may be placed on a combustible floor protected with hollow masonry not less than four inch (100 mm) thick covered with sheet metal not less than 24 gage.

4.04: continued

Such masonry shall be laid with ends unsealed and joints matched in such a way as to permit free circulation of air from side to side through the masonry to accommodate a downflow furnace. For such installations the furnace shall be securely anchored to maintain the clearances required in Table 4.04 1.

6. The supply and return duct system of a central heating appliance shall be installed in accordance with NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems, and NFPA 90B, Standard for the Installation of Warm Air Heating and Air Conditioning Systems and the mechanical code referenced by 780 CMR: *Massachusetts State Building Code*.

7. A return system shall be arranged so that negative pressure from the circulating fan cannot affect the air supply for combustion or act to draw products of combustion from joints or openings in the appliance, chimney connectors, or chimney.

8. A downflow furnace shall be installed so that there are no open passages in the floor through which flame or hot gases from a fire originating in the room below the floor can travel to the room above.

9. A downflow furnace shall be automatically operated and equipped with an approved temperature limit control that will limit outlet air temperature to 200°F (93°C). The furnace shall be designed to prevent unsafe temperatures in the event of reverse flow.

(p) Attic Furnaces. A furnace may be installed in an attic provided it is listed for such installation and installed in accordance with its conditions of listing.

(q) Duct Furnaces.

1. A duct furnace shall be installed with clearances of at least six inches (150 mm) to adjacent walls, ceilings, and floors of combustible material, except a duct furnace listed for installation at lesser clearance may be installed in accordance with its listing.

2. A duct furnace flue pipe shall be installed to provide a clearance to combustible material of not less than 18 inches (0.5 m).

3. A duct furnace and its chimney connector shall be permitted to be installed in a room but not in a confined space, such as an alcove or closet, with reduced clearances to combustible material, provided the combustible material is protected as described in Table 4.04 2., and Figures 4.04 5., 6., and 7.

4. A duct furnace shall be firmly supported.

5. Access panels shall be provided in the ducts on both the upstream and downstream sides of the furnace.

6. Controls shall be located outside the duct except for the sensing element of a control.

(r) Floor Furnaces.

1. Floor furnaces shall not be installed in floors of combustible construction unless specifically listed for such installation and installed in accordance with their listing.

2. The floor around the furnace shall be braced and headed with a framework of material not lighter than the joists. Floor furnaces shall be supported independently of the floor grilles.

3. With the exception of wall-register models, a floor furnace shall be placed not closer than six inches (150 mm) to the nearest wall, and wall-register models shall be placed not closer than six inches (150 mm) to a corner.

The furnace shall be so placed that a door, drapery, or similar object cannot be nearer than 12 inches (0.3 m) to any portion of the register of the furnace.

4. The bottoms of the floor furnaces shall have at least six inches (150 mm) clearance from the ground. Where the ground must be excavated to provide this clearance, the excavation shall extend at least 12 inches (0.3 m) beyond the furnace on all sides, and not less than 18 inches (0.5 m) on the control side. Where such excavation exceeds 12 inches (0.3 m), or the ground contour and ground moisture conditions are such that water seepage is likely, a watertight pan constructed of copper, galvanized iron, or other suitable corrosion-resistant material and properly anchored in place, or a waterproof concrete pit, shall be provided under the furnace. The sides of a pan or pit shall extend four inches (100 mm) above ground level.

4.04: continued

5. Floor furnaces shall be made readily accessible. Openings in foundation walls and trap doors in floors shall be not smaller than 18 inches by 24 inches (0.5 m by 0.6 m). Under-floor passageways to the furnace shall be not less than 24 inches high by 24 inches wide (0.6 m by 0.6 m).

6. Provision shall be made for proper air supply for combustion.

7. Listed floor furnaces may be installed in an upper floor provided the furnace assembly projects below into a utility room, closet, garage, or similar nonhabitable space. In such installations, the floor furnace shall be enclosed completely (entirely separated from the nonhabitable space) with means for air intake and with access facilities for servicing on the control side. The minimum furnace clearances shall be six inxhes (150 mm) to all sides and bottom.

The enclosure shall be constructed of portland cement plaster on metal lath or material of equal fire resistance.

8. No floor furnace shall be installed in the floor of any aisle or passageway of any auditorium, public hall, or public assembly room or in an exit way from any such room or space.

9. A floor furnace chimney connector shall be installed with clearances to combustible material of not less than nine inches (225 mm).

10. A floor furnace chimney connector shall be permitted to be installed with lesser clearances to combustible material provided the combustible material is protected as described in Table 4.04 2., and Figures 4.04 5., 6., and 7.

(s) Furnaces Used with Refrigeration Systems.

1. A furnace shall not be installed in conjunction with a refrigeration coil when circulation of cooled air is provided by the blower unless the blower has sufficient capacity to overcome the external static resistance imposed by the duct system, furnace, and cooling coil at the air throughout required for heating or cooling, whichever is greater.

2. To avoid condensation within heating elements, furnaces used in conjunction with cooling equipment shall be installed in parallel with or on the upstream side of cooling coils unless the furnace has been specifically listed for downstream installation. With a parallel flow arrangement, the dampers or other means used to control the flow of air shall be sufficiently tight to prevent any circulation of cooled air through the unit.

3. When furnaces are to be located upstream from cooling units, the cooling unit shall be so designed or equipped as to not develop excessive temperatures or pressures.

4. Furnaces may be installed downstream from evaporative coolers or air washers if the heating element is made of corrosion-resistant material.

Stainless steel, ceramic-coated steel, or an aluminum-coated steel in which the bond between the steel and the aluminum is an iron-aluminum alloy are considered to be corrosion resistant. Air washers operating with chilled water, which delivers air below the dew point of the ambient air at the appliance, are considered as refrigeration systems.

(t) Industrial Furnaces and Boilers, Stationary Type.

1. Industrial furnaces and power boilers, stationary type, shall include low-heat, medium-heat and high-heat appliances. *See* definitions.

2. Low-heat Appliances:

a. Low-heat appliances shall be installed with clearances not less than those indicated by Form III, in Table 4.04 1.

b. Low-heat appliances that are approved for installation with lesser clearances than specified in 527 CMR 4.04(5)(t)2.a. may be installed in accordance with their listing.

c. Low-heat appliances shall be permitted to be installed with lesser clearances to combustible material provided the combustible material is protected as described in Table 4.04 2.

4.04: continued

d. Floor-mounted low-heat appliances, except as provided in 527 CMR 4.04(5)(t)2.e and f., shall be placed on the ground, or on floors of fire-resistive construction with noncombustible flooring or surface finish and with no combustible material against the underside thereof, or on fire-resistive slabs or arches having no combustible material against the underside thereof. Such construction shall extend not less than 12 inches (0.3 m) beyond the appliance on all sides.

e. Appliances that are listed specifically for installation on a floor constructed of combustible material shall be permitted to be placed in accordance with the conditions of such listing.

f. Low-heat appliances shall be permitted to be placed on combustible floors although not listed for such installation, provided the floor under the appliance is protected in accordance with the requirements of accepted building code practice.

3. Medium-heat Appliances:

a. Medium-heat appliances shall be installed with clearances not less than those indicated by Form IV, Table 4.04 1.

b. Medium-heat appliances shall be placed on the ground or on floors of fire-resistive construction with noncombustible flooring or surface finish and with no combustible material against the underside thereof, or on fire-resistive slabs or arches having no combustible material against the underside thereof. Such construction shall extend not less than three feet (one m) beyond the appliance on all sides.

c. Medium-heat appliances may be placed on combustible floors although not listed for such installation, provided the floor under the appliance is protected in accordance with accepted building code practice.

d. Rooms containing medium-heat appliances shall be provided with means of ventilation adequate to prevent accumulation of hot air over or near the appliance.

4. High-heat Appliances:

a. High-heat appliances shall be installed with clearances to combustible material of not less than ten feet (three m) at the sides and rear, and not less than 15 feet (4.5 m) above, and not less than 30 feet (nine m) at the front or side where hot products are removed.

b. Rooms containing high-heat appliances shall be provided with means of ventilation adequate to prevent accumulation of hot air over or near the appliance.

c. High-heat appliances shall be mounted on the ground, or on floors of fire-resistive construction with noncombustible flooring or surface finish and with no combustible material or construction against the underside thereof; floors that shall in all cases extend not less than ten feet (three m) on all sides and not less than 30 feet (nine m) at the front or side where hot products are removed.

(u) Miscellaneous Heaters (Air Heater, Salamander, etc.).

1. A direct-fired heater, or salamander, shall not be used within an enclosed space or in proximity to combustible material. It may be used where salamanders fired by coal or coke are allowed.

2. An air heater shall be of a type designed to discharge air at a temperature of not more than 250°F (121°C).

3. A flexible duct, if used, shall be made of material resistant to heat and flame that will withstand prolonged exposure to temperatures as high as 250°F (121°C).

4. An air heater installed inside a building shall be provided with a chimney connector to conduct the flue gases to the outside.

(v) Recessed Wall Furnaces.

1. Listed recessed wall furnaces may be installed in combustible construction. Because of the necessity for closely correlating the installation of recessed wall furnaces with the building construction, the authority having jurisdiction shall be consulted for the proper installation methods to be followed. Recessed wall furnaces shall be installed in accordance with the manufacturer's instructions.

2. Recessed wall furnaces shall be located so as not to cause a hazard to walls, floors, curtains, furniture, doors, etc. The face of a warm air register shall be not less than 36 inches (one m) from any wall or combustible surface directly opposite the register.

4.04: continued

3. Panels, grilles, and access doors that must be removed for normal servicing operations shall not be attached to the building construction.

4. Adequate combustion and circulating air shall be provided.

(w) Restaurant-Type Cooking Appliances, Floor Mounted.

1. Floor-mounted restaurant-type cooking appliances shall be installed with clearances to combustible material of not less than 18 inches (0.5 m) at the sides and rear of the appliance and from the chimney connector thereof, and not less than 48 inches (1.2 m) above the cooking top and at the front of the appliance.

2. Floor-mounted restaurant-type cooking appliances that are listed for installation with lesser clearances than specified in 527 CMR 4.04(5)(w)1. may be installed in accordance with the conditions of their listing.

3. Floor-mounted restaurant-type cooking appliances shall be permitted to be installed in rooms, but not in confined spaces such as alcoves, with lesser clearance to woodwork or other combustible material, provided the combustible material is protected as described in Table 4.04 2, Protection Types (b), (c), and (d). Where a wall or cabinet of combustible material adjacent to the cooking top section of the appliance is not shielded from the cooking top section by a high shelf, warming closet, or other such part of the appliance, the protection shall extend for a distance of at least two feet. (0.6 m) above the surface of the cooking top. Such wall or cabinet shall be protected even though the appliance is listed for "close-to-the-wall" installation.

4. Floor-mounted appliances, except as provided in 527 CMR 4.04(5)(w)5. and 6., shall be placed on floors of fire-resistive construction with noncombustible flooring or surface finish and with no combustible material against the underside thereof, or on fire-resistive slabs or arches having no combustible material against the underside thereof. Such construction shall in all cases extend not less than 12 inches (0.3 m) beyond the appliance on all sides.

5. Floor-mounted appliances that are specifically listed for installation on a floor constructed of combustible material shall be permitted to be placed in accordance with the conditions of such listing.

6. Floor-mounted appliances shall be permitted to be placed on combustible floors although not listed for such installation, provided the floor under the appliance is protected in accordance with the requirements of accepted building code practice.

(x) Unit Heaters, Suspended Type.

1. Suspended-type unit heaters shall be installed with clearances to combustible material not less than those indicated in Table 4.04 1.

2. Suspended-type unit heaters that are listed for installation with lesser clearances than specified in 527 CMR 4.04(5)(x)1. shall be permitted to be installed in accordance with their listing.

3. Suspended-type unit heaters shall be permitted to be installed with lesser clearances to combustible material provided the combustible material is protected as described in Table 4.04 2., and Figures 4.04 5., 6., and 7.

4. Suspended-type heaters shall be safely and adequately supported. Hangers or brackets supporting heaters shall be metal.

5. The location of any suspended unit heater or the duct work attached thereto shall be such that a negative pressure will not be created in the room in which the unit heater is located.

6. A suspended unit heater shall not be attached to a warm air duct system unless listed for such installation.

(6) Installation of Outdoor Appliances.

(a) Appliances listed for outdoor installation may be installed without additional environmental protection in accordance with the terms of their listing and shall be accessible for servicing.

(b) Appliances not listed for outdoor installation may be installed outdoors if approved for such installation. Among the factors to be considered in judging the acceptability of appliances installed outdoors are:

4.04: continued

1. protection from physical damage;
2. location of combustion air and other openings into the appliance;
3. surface temperatures;
4. weatherproofing;
5. adequate and safe venting; and
6. clearances to adjacent combustibles.

(7) Applications on Roofs.

(a) General.

1. Appliances on roofs shall be designed or enclosed to withstand climatic conditions in the area in which they are installed. If enclosures are provided, each enclosure shall permit easy entry and movement, shall be of reasonable height, and shall have at least 30-inches (0.76-m) clearance between the entire service access panel of the equipment and the wall of the enclosure.

2. Roofs on which equipment is to be installed shall be capable of supporting the additional load or shall be reinforced to support the additional load.

3. All access locks and screws and bolts shall be of corrosion-resistant material.

(b) Installation.

1. Appliances shall be installed in accordance with their listing and with the manufacturer's instructions.

2. Appliances shall be installed on a well-drained surface of the roof. At least six feet (1.8 m) of clearance shall be maintained between any part of the appliance and the edge of the roof or similar hazard. Alternatively, rigidly fixed rails or guards at least 42 inches (1.1 m) high shall be provided on the exposed side of the appliance. Parapets or other parts of the building structure that are at least 42 inches (1.1 m) shall be permitted to be used in lieu of rails or guards.

3. All equipment requiring an external source of electrical power shall be provided with a readily accessible electrical disconnect that will completely de-energize the equipment. This disconnect shall be installed within sight of the equipment. All equipment requiring an external source of electrical power shall be provided with a 120-volt AC ground-type receptacle outlet that is located adjacent to the equipment. This receptacle outlet shall be connected to the supply side of the electrical disconnect.

4. Where water stands on the roof at the equipment or in the passageways leading to the equipment, or where the roof is of a water-sealed design, a suitable platform or walkway, or both, shall be provided above the water line. The platform or walkway shall be located adjacent to the equipment and the control panels so that equipment can be safely serviced.

5. Appliances located on roofs or other elevated platform shall be accessible.

(8) Preheating of Oil. Where preheating of oil is utilized, it shall be by an approved heater.

(9) Disposal of Flue Gases.

(a) General. All oil fired appliances other than direct-fired heaters, listed kerosene stoves, and listed portable kerosene heaters, shall be exhausted as described below.

527 CMR 4.04(9) recognizes that the choice of venting materials and methods of installation of venting systems are dependent on the operating characteristics of the oil burning appliance.

The operating characteristic of vented oil heating appliances can be categorized with respect to:

1. positive or negative pressure within the venting system; and

2. whether or not the equipment generates flue or vent gases which may condense in the venting system.

b. Chimneys and Chimney Connectors.

1. Masonry chimneys and metal chimneys (smokestacks) shall be built in accordance with 780 CMR: *the Massachusetts State Building Code*.

2. Factory built chimneys shall be listed and shall be installed and used in accordance with their listing and manufacturer's instructions.

4.04: continued

3. Prior to installation of an oil burner or oil burning appliance, the chimney or venting system to which it is to be connected shall be examined by the installer and shown to be in good condition.
4. An appliance shall be placed so that the chimney connector will be as short as practicable. The horizontal length of a chimney connector for natural-draft burners shall not exceed ten feet. unless a draft booster is used. For appliances requiring a negative chimney draft, the chimney connector shall be no longer than 75% of the chimney above the chimney-connector inlet.
5. No chimney connector shall pass through any floor or ceiling.
6. No chimney connector of any medium - or - high-heat appliance shall pass through any combustible wall or partition. Chimney connectors of other appliances shall not pass through combustible walls or partitions unless they are guarded at the point of passage by (1) metal ventilated thimbles not less than 12 inches larger in diameter than the connector or (2) metal or burned fire clay thimbles built in brickwork or other approved fireproofing materials extending not less than eight inches beyond all sides of the thimble; or, in lieu of such protection, all combustible material in the wall or partition shall be cut away from the chimney connector a sufficient distance to provide the clearance required from such connector. Any material used to close up such opening shall be noncombustible insulating material.
7. A thimble shall be installed and extended through a chimney wall to the inner face or liner but not beyond. The thimble shall be permanently cemented in place to facilitate removal of the chimney connector for cleaning.
8. The chimney connector for its entire length shall be not smaller than the flue collar of the appliance unless otherwise recommended by the appliance or chimney manufacturer. The chimney connector throughout its entire length shall be readily accessible for inspection, cleaning, and replacement.
9. The chimney connector shall be of steel or refractory masonry and shall be maintained in good condition.
10. The chimney connector shall maintain a pitch or rise of at least ¼ inch to the foot (6.3 mm to the 0.3 m) (horizontal length of pipe) from the appliance to the chimney.
11. The chimney connector shall be installed so as to avoid sharp turns or other construction features that would create excessive resistance to the flow of flue gases. No device which will obstruct the free flow of flue gases shall be installed in a chimney connector or chimney. This shall not be construed to prohibit the use of devices specifically listed for installation in a chimney connector such as heat reclaimers, automatic dampers, and safety controls.
12. The chimney connector shall be securely supported and joints fastened. Each section of smoke pipe shall be secured with at least three metal screws located not less than ½ inch from the point where the sections join.
13. Clearance from combustible construction or materials shall be in accordance with Table 4.04 1. except as permitted by 527 CMR 4.04(9)(b)6. and Table 4.04 2.
14. A connector shall not be connected to a chimney flue serving a fireplace unless the fireplace opening is sealed or the chimney flue that vents the fireplace is permanently sealed below the connection.
15. Connectors serving appliances operating under natural draft shall not be connected into any portion of a mechanical draft system operating under a positive pressure.
16. Connectors for appliances installed in attics shall be of a Type L vent material or the chimney shall be attached directly to the appliance.

(c) Type L Venting Systems.

1. Listed Type L venting systems may be employed with appliances listed as suitable for use with Type L venting systems.
2. Type L venting systems shall be installed and used in accordance with their listings and the manufacturer's instructions.

4.04: continued

3. A Type L venting system shall be capable of producing a draft not less than that for which the appliance(s) connected thereto is listed and as recommended by the manufacturer of the appliance.
4. The flue-gas exit of a Type L venting system shall be at least two feet (0.6 m) above the highest point where it passes through the roof of a building and at least two feet (0. 6 m) higher than any portion of a building within ten feet (3 m) of such Type L venting system.
5. Vent connectors used with type L venting systems shall be installed the same as chimneys connectors in 527 CMR 4.04(9)(b).

(d) Power Vent Systems.

1. A power vent system shall consist of a power venter, vent hood (or a combination power vent hood), air pressure switch and post purge control. If the air pressure switch is of the adjustable type, a secondary safety control shall be required.
2. Power vent systems must be listed, labeled, approved and installed in accordance with their listings and manufacturers installation instructions.
3. When a separate power venter and vent hood is employed, the power venter shall be installed as close to the vent hood as possible.
4. All joints or connections on the outlet side or positive pressure side of the power venter shall be sealed with a high temperature sealant to prevent leakage of combustion gases into the building.
5. Power vent systems shall be of sufficient size and design capacity to adequately vent the maximum input capacity (Btu rating) of the oil burning appliance to be vented. It shall also satisfy the draft requirements of the oil burning appliance manufacturer.
6. The air pressure switch shall be wired according the manufacturer's instructions to prevent the oil burner from operating when the power vent system is not operating properly.
7. The vent system shall terminate at least three feet above any forced air inlet located within ten feet. Exception: This provision shall not apply to the combustion air intake connected directly to the burner.
8. The venting system shall terminate at least four feet below, four feet horizontally from or one foot above any door, window or gravity air inlet of the structure. The outlet of the vent shall terminate at least 12 inches above grade.
9. The power vent system shall not terminate less than three feet from an inside corner of an L shaped structure or in accordance with the manufacturer's instructions.
10. The vent system shall not be mounted directly above or within three feet horizontally from an oil tank.
11. The vent system shall not terminate less than seven feet above normal grade when located next to public walkways.
12. The vent system shall not terminate under outside decks or porches. Exception: If the appliance served by the vent system does not provide domestic hot water and the vent termination is at least four feet below the deck or porch. The porch or deck where the vent terminates shall not be enclosed so as to inhibit the dilution of flue gases.
13. The vent connector from the oil fired appliance to the power venter shall be installed according to the power vent systems listing and manufacturers installation instructions. In the absence of such listing, the vent connector shall be installed like a chimney connector in 527 CMR 4.04(9)(b).

(e) Draft.

1. A chimney shall be capable of producing a draft not less than that for which the appliance connected thereto is listed and as recommended by the manufacturer of the appliance. To conform to this requirement, a draft booster may be used to increase low draft. When a draft booster is used, provision shall be made to shut off the fuel supply to the main burner in the event of failure of the draft booster.

4.04: continued

2. Two or more oil-burning appliances may be connected to a single chimney provided sufficient draft is available for safe combustion in each appliance and all products of combustion are safely removed to the outdoors.
3. Where chimney-downdraft conditions cause faulty operation, thereby creating a hazard, corrective steps shall be taken.

(f) Draft Regulators.
1. A draft regulator shall be provided for each oil-fired appliance required to be connected to a chimney unless the appliance design, conditions of installation, or combinations thereof, preclude excessive chimney draft, or the appliance is listed for use without one.
2. A draft regulator, when used, shall be installed in the same room or enclosure as the appliance and in such a manner that no difference in pressure between the air in the vicinity external to the regulator and the combustion air supply will be permitted.
3. A manually operated damper shall not be placed in the chimney connector from an oil-fired appliance.

Exception: When two or more oil-fired appliances are connected to a common chimney, manual isolating dampers are allowed. When such dampers are used, they shall be interlocked to prevent burner operation unless the damper is in a safe position.

4. Automatically operated dampers shall be of approved type designed to maintain a safe damper opening at all times and arranged to prevent starting of the burner unless the damper is opened to a safe position.
5. Where the chimney connectors of two or more appliances requiring draft regulators are manifolded together, a draft regulator shall be installed in the connector of each appliance.
6. Fixed baffles may be installed in the appliance flue collar where they are specified by the appliance manufacturer and are securely fastened into position. Such baffles, when in a closed position, shall not block off more than 80% of the chimney connector area.

4.05: Oil Burners, Heavy Fuel Oil Type

(1) General. 527 CMR 4.04 shall apply to power burners or the heavy fuel oil type unless specifically deleted or modified in 527 CMR 4.05.

(2) Oil Pumps.
(a) An oil pump shall be of an approved type, secure against leaks and rigidly fastened in place.
(b) Pumps used in connection with the supply and discharge of outside, aboveground storage tanks shall be located outside of the embankments or dikes surrounding the tanks, and at such points that they will be accessible at all times, even if the oil in the tanks is on fire.

(3) Valves.
(a) Every fuel oil burner shall be equipped with a hand shut-off valve in the main oil supply line at or near the tank where the tank is located inside the building; and when the tank is located outside the building the valve shall be located in the oil supply line inside the building near the wall where such line enters the building.
(b) The hand shut-off valve mentioned in 527 CMR 4.05(3)(a) shall be a lever gate valve.

There shall be a weight attached to the end of the lever by means of a suitable wire, which weight shall be suspended, near the valve, by means of a second wire, which second wire shall be run through suitable pulleys terminating at a point near an outside window or approved glass-covered box, so that access can be made from the outside or the building to said wire for the purpose of closing the valve. Said wire shall have two fusible links one near the valve and one near the window or approved glass-covered box.

4.05: continued

(c) Outside the building, immediately adjacent to said window or approved glass-covered box, there shall be a metal sign bearing the words "oil shut-off".

(d) Where a shut-off valve is installed in the discharge line of an oil pump, an approved pressure relief valve shall be connected into the discharge line between the pump and the shut-off valve and so arranged as to return surplus oil to the storage tank or to by-pass it around the pump.

(e) A control valve shall be of an approved type, which shall be provided with a stuffing box of liberal size, containing a removable cupped gland designed to compress the packing against the valve stem and so arranged as to facilitate removal.

The valve shall be designed to close against the supply, and to prevent withdrawal of the stem by continued operation of the hand-wheel. Packing affected by the oil or heat shall not be used.

(4) Preheating of Oil. Where preheating of the oil is necessary, it shall be by steam, hot water or an approved electric heater. Heaters shall be substantially constructed; and all joints shall be made oil tight. Oil filled thermometers/gauges shall be installed at suitable locations to indicate the temperature of the heated oil.

A low oil temperature cut-off switch shall be provided to electrically interrupt the burner operation.

The temperature setting on this control shall be in accordance with the burner manufacturer's recommendations. Oil which has not been properly preheated shall be by-passed back to the pump supply. An adequate by-pass pressure relief valve shall be provided to prevent abnormal pressure in the system.

(5) Oil Burner Controls.

(a) In a fully automatic system where either steam or air is used for atomizing the oil, an approved pressure supervisory switch shall be installed to interrupt burner operation in event of loss of adequate pressures as recommended by burner manufacturer. An approved low oil pressure supervisory switch and an approved high oil pressure supervisory switch shall be installed in the oil supply line to interrupt burner operation in event of pressures exceeding those recommended by burner manufacturer.

(b) An electric motor driven, manual or semi-automatic oil burner with an integral oil pump, or an electric motor driven pump set for use with a manual or semi-automatic burner not equipped with an integral pump, shall be supplied with an approved motor controller incorporating power failure protection, wired into the power supply to the motor.

(c) A proven igniter or pilot flame must be used on all heavy oil burners.

1. The flame verification control shall prove the presence of an adequately sized and positioned pilot flame to safely and smoothly ignite the main fuel prior to allowing the main fuel valve to open. The time for trial for pilot proving shall be limited to a maximum of ten seconds.

The time for trial for main flame ignition, after pilot proving shall be limited to a maximum of 15 seconds. In the event of a flame failure once combustion is established, the oil supply shall be shut off to the burner within three seconds nominal. Any oil burner designed for compound or proportional firing rates shall be provided with an electrical interlock switch to prove that the burner is in the low fire position prior to allowing the ignition to be energized.

2. The responsible oil burner installer shall certify in writing to the head of the fire department that a pilot turn down test, a hot refractory hold-in test and spark ignition response test have been made prior to approval of installation.

3. The flame verification primary control and flame detectors used on all heavy burners shall incorporate a safe start component check.

In addition the flame verification primary control used on any burner with firing rate of more than 20 gallons per hour shall include provisions for a continuous circuit component check of the flame verification primary circuit and the flame detector throughout the flame proving period.

4.05: continued

4. An approved combustion air supervisory switch shall be installed on motorized dampers to interrupt burner operation on a loss of adequate combustion air.
5. When used, induced and/or forced draft fans shall be electrically interlocked with motor starters of burner motors to prevent the burner operation when draft fans are not operating.

(d) Every manually-controlled oil burner and every semi-automatic oil burner which is usually lighted and extinguished manually must be equipped with all the safety devices outlined in 527 CMR 4.00.

(6) Electric Wiring and Equipment.

(a) All electric wiring and equipment in connection with fuel oil burners shall conform to 527 CMR 12.00: the *Massachusetts Electric Code.* All protective, control and emergency devices shall be series connected in the ungrounded line conductors.

(b) Electronic flame detector wires shall be of moisture resistance synthetic insulation in accordance with control manufacturer's recommendations. If lead sulfide cell detector is used, the electrical leads must be run in separate approved enclosure per manufacturer's instructions.

(c) An approved device to stop the flow of current through the live side of the line under conditions excessive room temperature shall be installed in the main power line at or adjacent to the heater.

(7) Installation.

(a) A smokepipe for a single boiler shall not be equipped with a manually-operated damper. Where there is more than one boiler equipped with oil burners, any smokepipe damper may be closed manually when said boiler is not in use, provided that said damper be weighted so that it shall normally be open, and provided further that said damper or damper arm be equipped with a mercury type or other approved switch is connected to the control circuit of the oil burner firing said boiler so that said oil burner cannot start until the damper attains an open or nearly open position.

(b) A room or other enclosure in which an oil burner is located shall be provided with an adequate air supply for continuous complete combustion of oil in 527 CMR 4.04(5)

Further, if all the air is drawn from outdoors by means of vertical ducts, each opening shall have a free area of not less than 35 square inches per gallon per hour of the total input rating of all appliances in the enclosure.

If horizontal ducts are used each opening shall have a free area of not less than 70 square inches per gallon per hour of the total input of all appliance in the enclosure.

4.06: Range Oil Burners

(1) General.

(a) The pertinent provisions of 527 CMR 4.03: *General Requirements*, shall apply to the installation of range oil burners.

(b) Only no. 1 Fuel Oil or Kerosene shall be used in a range oil burner.

(c) The use of gasoline or other volatile liquid for priming is prohibited.

(d). The range or stove shall be so elevated above the floor or insulated by a suitable hearth, as to preclude contact with woodwork, or other combustible material.

(e) Where electricity is available and the top of the storage tank is below the level of the oil burner base, oil may be delivered to the burner or burners by means of an approved automatic pump which discharges oil directly to a control chamber from which the oil flows by gravity to the burner or burners.

(f) When a hand pump is used to fill a gravity tank or a fixed vacuum feed type tank, a valve shall be so installed close as to the feed line to the burner so that no increase in pressure of the oil supply at the burner shall result when the pump is in use.

4.05: continued

(2) Tanks.

(a) A supply tank which is fixed in position on or is built into the range shall not have a capacity in excess of three gallons. Such a tank shall be substantially constructed and specifically approved for the purpose intended. Such a tank shall be filled only by means of an approved hand or electric pump equipped with a positive means to prevent overflowing or the tank.

(b) A glass or metal tank of the vacuum feed type shall not have a capacity in excess of three gallons.

A glass vacuum tank which is installed or replaced on or after January 1, 1948 shall be equipped with a substantial approved metal guard for protection against breakage.

A metal vacuum tank which is installed or replaced on or after January 1, 1948 shall be of not less than 24 U.S. gauge prime terne steel plate, with soldered double top and bottom seams and a soldered locked sideseam of material and construction approved as equivalent and shall be tested under not less than three pounds pressure under water before being coated or painted.

(c) The vacuum type tank shall be located at least two feet from the device in which the burner is installed; and shall only be so located that the temperature rise in the oil in such a tank is not excessive when the burner is operated at full capacity. Otherwise, such tanks shall be protected against the effects of heats with non-combustible material of at least one hour fire-resistive material properly supported.

(d) A supply tank shall be securely attached to non-combustible supports. A vacuum feed type supply tank shall be rigidly fastened to the floor or wall in such a manner as to minimize the possibility of mechanical injury due to accidental contact, jarring or vibration. The vacuum feed control unit shall be adjusted to the proper level for the burner and permanently fixed in place by the installer by means of a substantial bolt or rivet extending through both the control unit and the supporting standard, and headed over so as to prevent tampering. Such bolt or rivet shall be independent of and in addition to the set-screw supplied by the manufacturer.

(e) A supply tank shall be provided with a means of determining the oil level which will not involve the possible leakage of oil.

(3) Constant Level Control. An approved anti-flooding device, which is designed to maintain a constant level of oil at the burner and to prevent an abnormal discharge of oil, shall be installed between the supply tank and the burner. The anti-flooding device shall be adjusted to the proper level for the burner and permanently fixed in place by the installer.

(4) Piping and Tubing.

(a) Piping shall be standard wrought iron, steel or brass pipe with approved fittings or approved brass or copper tubing with approved fittings; and it shall be carefully protected against mechanical injury in a manner satisfactory to the head of the fire department. In all piping systems, proper allowance shall be made for expansion, contraction, jarring and vibration.

(b) All piping shall be separated from electrical wiring which is not enclosed in approved conduit, raceway or armor by some continuous and firmly fixed non-conductor which creates a permanent separation.

(c) Brass or copper tubing shall have a wall thickness of not less than 0.032 of an inch.

(d) The supply pipe to the burner shall not be less than ¼ inch iron pipe size unless approved brass or copper tubing is used in which case the tubing shall not be less than 5/16of an inch outside diameter.

(e) Pipe connections to tanks shall be suitably reinforced and, in the installation of the connecting pipe or tubing, proper allowance shall be made for expansion, contraction, jarring and vibration; and, where necessary, suitable provisions shall be made for protection against mechanical injury.

(f) All connections shall be made perfectly tight with well fitted joints. Connections which are used at the burners shall be of a type to facilitate removal. Joint fittings shall be of an approved type.

4.06: continued

(5) Valves.

(a) Valves shall be so installed as to be readily accessible.

(b) A shut-off valve shall be installed at the discharge side of an automatic pump and at the discard side of a gravity tank other than a vacuum type gravity tank.

(6) Installation.

(a) A burner shall be accurately leveled and rigidly secured in place within the combustion chamber of the stove or range.

(b) In order to insure positive bottom ventilation and an adequate air supply, the air-regulating device in the front of the stove or range shall be permanently fastened in the open position.

(e) When a range oil burner is placed in a range or stove originally designed for solid fuel, it shall not be installed until the flue passageways have been thoroughly cleaned to assure venting. Before installation, the walls of the combustion chamber of the stove or range shall be thoroughly inspected for cracks or other openings to other portions of the device, and the combustion chamber walls shall be made tight with no opening other than air supply and that leading to chimney uptake.

(d) Stoves and other similar appliances equipped with range oil burners having supply tanks of more that two gallon capacity shall be connected to suitable flues having sufficient draft at all times to assure safe operation of the burner. Manually-operated dampers shall only be used with sleeve-type burners. Such dampers, if used, shall be such that they cannot be closed more than 80% of the internal cross-sectional area of the smokepipe.

The use of manually-operated smokepipe dampers with pot-type burners is prohibited.

(e) A room or other enclosure in which an oil burner is located shall be provided with an adequate air supply for continuous combustion of oil as specified in 527 CMR 4.04(5).

4.07: Room Heaters, Water Heaters and Miscellaneous Oil Burning Equipment

(1) General.

(a) The pertinent provisions of 527 CMR 4.03: *General Requirements*, and 527 CMR 4.04: *Oil Burners, Light Fuel Oil Type*, shall apply to the installation, use and maintenance of such appliances.

(b) Only fuel oil as specified by the manufacturer shall be used in such appliances.

(c) The use of gasoline or other volatile liquid for priming is prohibited.

(d) Whenever such an appliance is placed in operation only the lighting device supplied by the manufacturer or designed for that purpose may be used.

(2) Installation.

(a) Such appliances shall be located in relation to adjacent combustible materials as to prevent scorching, charring or ignition thereof. Such appliances which are not provided with legs or some other means providing adequate base ventilation for the amount of heat generated in the device shall be set on suitable ventilated non-combustible foundations.

Such an appliance which is not provided with an integrally assembled drip pan shall be set upon a tray of sheet metal or other approved non-combustible material which, for a stove provided with an integrally mounted tank, shall extend 12inches back of and on each side of the tank.

Such appliance shall be so installed or placed that combustible curtains, draperies or other fabric hangings may not come in contact with heated surfaces or other open flame.

Such an appliance shall be carefully leveled in accordance with manufacturer's instructions for installation, and such condition shall be maintained throughout its use.

Such appliances which are designed for use with separately supported supply tanks or which must be connected to suitable flues, shall be securely affixed to floors or otherwise secured in position in order to avoid strains on piping. Such an appliance shall not be located so as to obstruct in any manner a means of egress.

4.07: continued

(b) Any room in which a space heater is installed or located shall be protected by an approved smoke detector which will give adequate warning and be located as directed by the head of the fire department. If electrically operated, this shall be in addition to 527 CMR 4.04(4).

(c) Such appliances with supply tanks of more that two gallon capacity shall be connected to suitable flues having sufficient draft at all times to assure safe operation of the burner. Manually-Operated dampers shall only be used with sleeve-type burners. Such dampers, if used, shall be such that they cannot close more than 80% of the internal cross-section area of the smokepipe.

The use of manually-operated smokepipe dampers with pot-type burners is prohibited. Oil burning heaters commonly called salamanders, used for temporary heating purposes, may be installed without a flue provided such unit has the approval of the state fire marshal and is installed under such conditions as prescribed by the head of the fire department. (*See* 527 CMR 20.00).

4.08: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 4.00 shall be considered a part of the requirements of 527 CMR 4.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 4.00: M.G.L. c. 148, § 10.

NON-TEXT PAGE

527 CMR 5.00: OPERATION AND MAINTENANCE OF BUILDINGS OR OTHER STRUCTURES USED AS GARAGES, SERVICE STATIONS AND THE RELATED STORAGE, KEEPING AND USE OF GASOLINE OR OTHER MOTOR FUEL

Section

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5.01: Scope

527 CMR 5:00 shall apply to all service stations where flammable and combustible fuels are stored and dispensed to motor vehicles, and all buildings and structures used for the storage, parking or servicing of motor vehicles.

5.02: Definitions

For the purpose of 527 CMR 5.00, the following words shall have the meanings respectively assigned to them:

Alteration. A change or modification of a building or structure, or the service equipment thereof, that affects safety or health and is not classified as an ordinary repair.

Approved. Approved by the Marshal.

Automatic. As applied to fire protection devices, automatic refers to a device or system providing an emergency function without the necessity of human intervention and activated as a result of a predetermined temperature, or increase in level of combustion products; such as incorporated in an automatic sprinkler system, automatic fire door, etc.

Building. A structure enclosed within exterior walls or fire walls, built, erected and framed of a combination of any materials, whether portable or fixed, having a roof, to a structure for the shelter of persons, animals or property. For the purpose of this definition, "roof" shall include an awning or any similar covering, whether or not permanent in nature. The word "building" shall be construed, where the context allows, as though followed by the words "or part or parts thereof."

Bulk plant. That portion of a property where flammable or combustible liquids are received by tank vessels, pipe lines, tank car or tank vehicle, and are stored or blended in bulk for the purpose of distributing such liquids by tank vessel, pipe line, tank car or tank vehicle.

Combustible liquid. Any liquid having a flash point at or above 100°F shall be known as Class II or III liquids. Combustible liquids shall be divided into the following classifications:
Class II. Liquids having flash points at or above 100°F and below 140°F.
Class IIIA. Liquids having flash points at or above 140°F and below 200°F.
Class IIIB. Liquids having flash points at or above 200°F.

Door, fire. A door and its assembly, so constructed and assembled in place as to give protection against the passage of fire in accordance with 780 CMR.

5.02: continued

Door assembly, fire. A combination of a fire door, frame, hardware, and other accessories which together provide a specific degree of fire protection to the opening in accordance with 780 CMR.

Flammable liquid Any liquid having a flash point below 100°F and having a vapor pressure not exceeding 40 psia at 100°F. Flammable liquids shall be known as Class I liquids and shall be divided into the following classifications:
Class IA. Liquids having flash points below 73°F and having a boiling point below 100°F.
Class IB. Liquids having flash points below 73°F and having a boiling point at or above 100°F.
Class IC. Liquids having flash points at or above 73°F and below 100°F.

Garage, private. A garage for four or less passenger motor vehicles without provision for repairing or servicing such vehicles for profit.

Garage, public. A building or structure for the storage, parking, care and/or repair or painting of, one or more passenger motor vehicles, motor powered boats, or commercial motor vehicles; with or without provision for the dispensing of gasoline, oil or other similar products for the servicing of such vehicles. Public garages shall be classified according to their specific use in one of the following groups.
Group 1: A public garage in which provision is made for the care, storage, repair or painting of or fuel-dispensing to motor vehicles.
Group 2: A public garage used exclusively for passenger vehicles that will accommodate not more than nine passengers.

Gasoline. A volatile flammable liquid that will emit a flammable vapor at a temperature of less than 100°F, to be ascertained by any standard closed-cup instrument.

Height. The height of a garage in stories does not include a basement or cellar.

Listed. Equipment or materials included in a list published by an organization acceptable to the Marshal, and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that equipment or materials meet appropriate standards or have been tested and found suitable for use in a specific manner.

Marshal. The State Fire Marshal.

Motor vehicle. Any vehicle containing or using gasoline or any other petroleum product for fuel or power, excluding vehicles having fuel tanks of one gallon or less capacity.

Nationally Recognized Testing Laboratory (NRTL). An organization which tests for safety and lists, labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00(Appendix C).

Repair, ordinary. Any maintenance which does not affect structure, egress, fire protection systems, fire ratings, energy conservation provisions, plumbing, sanitary, gas, electrical or other utilities. A building permit is not required for ordinary repairs.

Self-closing. Closing automatically or mechanically after opening.

Service station. Any building or premises wherein or upon which gasoline or other motor fuel is sold at retail.
Self-service type business. As used in 527 CMR 5.00, shall mean that type of business wherein the licensed motor vehicle operator dispenses his own motor fuel.
Full self-service facility. A service station where all the pumps are self-service.
Split-island facility. A motor fuel dispensing installation where part of the facility is used as self-service and part is used as attendant service.

Service station operator. The person responsible for the service station operation or his duly authorized representative shall be a person 16 years of age or older.

5.02: continued

Sprinklers and sprinkler alarms. An adequate system of automatic sprinklers and sprinkler alarms shall be one that meets the generally accepted standards of engineering practice.

Structure. A combination of materials assembled at a fixed location to give support or shelter, such as a building, framework, retaining wall, tent, reviewing stand, platform, bin, fence, sign, flagpole, recreational tramway, mast for radio antenna, or the like. The word "structure" shall be construed, where the context requires, as though followed by the words, "or part or parts thereof".

Vertical Barrier. An obstacle, such as but not limited to guard posts, guard rails or pipe bollards, that prevents a motor vehicle from contacting a protected item such as but not limited to tanks or dispensing devices. The barrier must be at least 36 inches in height and be resistant to damage from the impact of a motor vehicle. Minimally, the barrier shall be able to resist a force of 12,000 pounds applied at three feet above the adjacent ground surface.

5.03: Location and Construction

(1) Design, construction, operation and use of private and public garages shall be in accordance with 780 527 CMR. Existing buildings undergoing repair, alteration, addition, and/or change in use shall comply with 780 CMR and 527 CMR.

(2) A special structure may be constructed without exterior walls provided that any open side of the structure be not less than 18 feet from any building or lot line, and that access for fire equipment be established on at least two sides of the structure. If any wall of the structure is located less than 18 feet from any building or interior lot line, a fire wall shall be constructed on that side between all floors and extended to the roof in compliance with 780 CMR, and further provided:

(a) that any permanent right of way may be considered as a part of the 18 foot distance from any adjoining interior lot line;
(b) that the space between the structure and the lot line is maintained free and unobstructed at all times;
(c) that if the structure does not exceed four stories in height and if the roof is to be used for the parking of motor vehicles, it shall be constructed of noncombustible continuous concrete slab construction;
(d) that the floor and roof shall have a continuous curb not less than six inches in height, securely anchored to the floor, located around the outside of the structure and ramps, if any; and shall also have a continuous protective railing located around the outside perimeter of the structure 42 inches high;
(e) that no repair work is done within the building;
(f) that the fueling of motor vehicles may be done on the floor nearest grade level provided it is performed in accordance with the pertinent provisions of 527 CMR 5.00;

5.03: continued

(3) A special structure consisting essentially of an elevator shaft containing a multiplicity of platforms suspended between two or more endless chains which may be moved UP or DOWN over wheels or gears, may be constructed of first class construction, or of special construction, provided:

(a) that the structure may be constructed without exterior walls to a maximum height of 100 feet and that all structural steel is of one hour fire protected construction;

(b) that no part of the structure shall be located nearer than 15 feet to any other building or interior lot line unless a fire wall has been constructed on that side between all floors and extending to the roof;

(c) that any permanent right-of-way may be considered as part of the 15 foot distance from any adjoining interior lot line;

(d) that the space between the building and the lot line is maintained free and unobstructed at all times;

(e) that the main support chains or cables are suitably enclosed on three sides by a one hour fire protected shaft for their entire length;

(f) that the system may be designed to operate above or below the ground for a maximum overall vertical distance of 100 feet, and that no personnel are allowed above or below the loading level whenever there are any cars on any part of the mechanism;

(g) that if the system is installed below ground level an adequate ventilation system shall be installed to continuously remove any fumes that may accumulate in the bottom of the shaft;

(h) that an adequate automatic sprinkler system and alarm shall be required and shall be so installed that a water curtain will develop not only around the outer wall adjacent to the fire, but also in the vertical inner space between the two rows of the lift;

(i) that each car position shall be complete with an underpan of steel which shall be dished in such a way that any liquid dropping into the pan will flow to a sump at the end of the pan normally beyond the rear of the parked car. There shall be a drain pipe at least one inch in diameter extending from the sump to as far out from the underpan as may be practicable;

(j) that the controls of the elevator shall be designed so that the lift may be moved in either direction for a complete revolution, and at least one set of controls shall be located in a first class fire resistive section of the structure, separated from the car loading area by a firewall complete with a fire window, so placed that the operator of the controls can see the location of the car ramp. Such enclosure shall be equipped with an exit door opposite the ramp;

(k) that no repair or service work is done within the building;

(l) that the fueling of motor vehicles shall be prohibited;

(m) that the provisions of 527 CMR 5.03(5)(a) and (b) need not apply except in the enclosing of stairways which serve as the required means of egress in case of fire

(4) When motor vehicles which are kept in a garage are loaded with merchandise which is of such a flammable nature as to be readily ignitable, such garage shall, if in the opinion of the head of the fire department it is deemed necessary, be equipped with automatic sprinklers

(5) Garages (or portions of) located below street level:

(a) Any portion of a building below street level hereafter to be used as a garage, lubricating pits and garages under 527 CMR 5.03(3) excepted, shall have its enclosing walls constructed in accordance with 780 CMR. The number of exits from this area shall also conform to the requirements of 780 CMR.

(b) No portion of a building below street level, with the exception of lubricating pits, shall be used as a garage unless the portion so used is equipped with an adequate mechanical ventilating system constructed in accordance with the requirements of the BOCA Mechanical Code.

EXCEPTION: If the pit is situated or constructed in such a way as to allow a free and natural floor ventilation sufficient to remove all vapor and gases therefrom, then the mechanical ventilating system shall not be required. The exception is contingent on a written statement from a professional mechanical engineer.

5.04: Electrical Wiring and Heating

(1) All electrical equipment and wiring shall be of a type specified by and shall be installed in accordance with the Massachusetts Electrical Code 527 CMR 12.00.

(2) In the case of a garage, other than a private garage, heated by a central heating unit located on or below the garage floor, such unit shall be located in a room separated from the garage by a fire partition and all openings therein shall be protected by either fire doors or fire windows. A garage may be heated by gas, oil, electric unit heater(s) and/or central heating units located in the heated area without fire partitions, provided that such equipment is located not less than eight feet above the garage floor, and in the case of gas or oil the combustion chamber of such heater shall be properly vented to the outer air. The hot air from a central heating unit shall enter the garage not less than four feet above the floor level of the garage. The return air registers of any duct distribution system connected to unit heater, central heater or warm air furnaces shall be located not less than four feet above the garage floor. No space heaters (as defined in 527 CMR 4.00) shall be permitted. Direct vent appliances (appliances that are constructed and installed so that all air for combustion is derived directly from the outside atmosphere and all flue gases are discharged to the outside atmosphere) may be installed in repair garages less that eight feet above the floor provided the bottom of the combustion chamber is not less than 18" above the floor and is protected from physical damage from vehicles.

(3) In the case of a private garage, any heater or appliance unit may be located on the garage floor provided the source of ignition from combustion chambers, motors, etc., shall be located not less than six inches above the floor level. In the case of a private garage having a floor below surrounding grade the combustion chamber or ignition source or any heater or appliance unit shall be raised not less than 18" above the floor level. Any heater or appliance unit installed in a private garage shall be suitably protected from physical damage as directed by the head of the fire department. No space heaters (as defined in 527 CMR 4.00) shall be permitted.

5.05: Storage

(1) Aboveground tanks, located at a bulk plant, shall not be connected by piping to a service station. Apparatus dispensing Class I fluids into fuel tanks of motor vehicles of the public shall not be located at a bulk plant unless separated by a fence or similar barrier from the area in which bulk operations are conducted.

(2) Class I fluids shall not be stored or handled within a building having a basement or pit into which flammable vapors can travel, unless such area is provided with ventilation that will prevent accumulation of flammable vapors therein.

(3) Each portable gasoline tank used in a garage shall not exceed 55 gallons in capacity, shall be mounted on a substantial iron or steel frame with rubber-tired wheels and shall be equipped with a suitable hose not exceeding 16 feet in length, having a shutoff valve located near the pump connection. The shut-off valve shall be kept closed when not in use.

(4) No gasoline shall be handled outside of storage tanks or portable gasoline tanks except in approved safety cans or approved metal or plastic containers, and they shall be kept tightly closed except when in use. Containers used for the handling and storage of gasoline in garages shall have a total quantity not to exceed 14 gallons, and no such container shall have a capacity in excess of seven gallons.

(5) All tanks used for the storage or sale of gasoline in connection with a garage or service station shall be constructed and installed and located in accordance with the provisions of 527 CMR 9.00.

(6) No tank that has been used for the keeping or storage of gasoline shall be removed or relocated except as provided in M.G.L. c. 148, § 38A, as amended.

5.06: Inventory

All underground storage facilities except fuel oil tanks and containers connected with burning equipment shall be installed and monitored for the prevention and detection of leakage of flammable and combustible liquids in accordance with the following provisions:

(1) Accurate daily inventory records by means of dip sticking shall be maintained and reconciled on all flammable or combustible liquid underground storage tanks for indication of possible leakage from said tanks or piping. Dipsticks shall be accurate and maintained in legible condition. The operator of the location shall be responsible to have on site an accurate dipstick calibration chart for each tank in which inventory by sticking is required. The records shall be kept on the premises or readily available for inspection by any member of the Department of Public Safety, head of the fire department or his designee, and shall include, as a minimum, records showing type of product, daily reconciliation between sales, use, receipts and inventory on hand. If there is more than one system consisting of a tank(s), serving pump(s) or dispenser(s) for any product, the reconciliation shall be maintained separately for each tank system.

(2) Daily inventory shall be maintained for each tank system at each location by the operator. The inventory records shall be kept for a minimum of the past 12 months at the premises or readily available. The term operator shall mean the lessee or persons(s) in control of and having responsibility for the daily operation of the facility for the storage and dispensing of flammable and combustible liquids.

(3) Inventory shall be based on the actual daily measurement and recording of tank product and water levels and the daily recording of actual sales, use, and receipts. Daily measurements will be acceptable either by gauge, gauge stick, or by readout from an automated gauging system. The inventory records shall include a daily computation of gain or loss. The mere recording of pump meter readings and product delivery receipts shall not constitute adequate inventory records.

(4) The operator of the location shall be responsible to notify the head of the fire department of situation, and to notify the owner or person(s) in control of the facility to take action to correct any abnormal loss or gain not explainable by spillage, temperature variations or other causes. The term owner shall mean the person(s) who owns, as real property, the tank storage system used for the storage and dispensing of flammable and combustible liquids.

(5) As a minimum the following steps shall be taken in an expeditious manner when daily inventory records indicate an abnormal loss:

(a) The inventory records shall be checked for error.

(b) If no error is apparent, an independent calculation of apparent loss shall be made by a qualified person starting from a point in time where the records indicate a no loss condition.

(c) If 527 CMR 5.06(5)(b) confirms no apparent loss, the readily accessible physical facilities on the premises shall be carefully inspected for evidence of leakage.

(d) If 527 CMR 5.06(5)(c) does not disclose a leak, the dispensers used with the particular product involved with the apparent loss shall be checked for calibration.

(e) If 527 CMR5.06(5)(a) through (d) do not explain the apparent loss, the situation shall be reported promptly to the head of the fire department.

(f) If 527 CMR 5.06(5)(d) does not explain the loss, and if the piping system can be tested without the need for excavation, the piping system between the storage tank and dispenser(s) shall be tested in accordance with 527 CMR 9.00. If it is necessary to excavate to perform a piping test, such a test shall be conducted after a storage tank test has been performed in accordance with 527 CMR 5.06(5)(g).

(g) If 527 CMR 5.06(5)(f) does not disclose a leak, the storage tank(s) shall be tested for tightness by an approved test.

(h) If 527 CMR 5.06(5)(a) through (g) do not confirm the apparent loss, the daily inventory shall be continued with a daily independent verification by a qualified person. Additional surveillance of the facility should be engaged to insure against unauthorized removal of product.

5.06: continued

(i) If any of 527 CMR 5.06(5)(a) through (h) or investigations indicate the source of the loss, the owner shall take immediate action to correct the system failure.

(6) Daily inventories need not be maintained on those days that an installation is not in operation, but not to exceed 15 days.

(7) The owner and operator will conduct an inventory verification program on a scheduled basis, at least once every year. A copy of the record of this verification program shall be kept on the premises available for inspection by any member of the Department of Public Safety or head of the fire department or his designee.

> NOTE: Upon the cessation of the exercise of a license, the holder of said license shall notify the local licensing authority and head of the fire department in his area or district. The head of the fire department shall prescribe rules to eliminate hazardous conditions incident to such cessation.

5.07: Dispensing Equipment

(1) Dispensing devices shall not be installed inside a building or less than ten feet from the outside of a building unless specifically approved by the head of the fire department.

(2) Any electrically operated gasoline dispensing system within a building shall be protected by a heat activated shutoff switch, which will shut off the pump automatically when the temperature reaches 165°F. This switch shall be located within two feet of the ceiling and within ten feet of the location of the nozzle discharge.

(3) At public garages, fuel dispensing areas shall be located on the level nearest grade. Fire walls and floor/ceiling assemblies, floor construction and drainage shall be installed in accordance with 780 CMR and 248 CMR 2.00.

(4) Dispensing devices at service stations shall be so located that all parts of the vehicle being served will be on the premises of the service station.

(5) A clearly identified and easily accessible switch(es) or circuit breaker(s) shall be provided at a location remote from dispensing devices, including remote pumping systems, to shut off the power to all dispensing devices in the event of an emergency. Signs identifying the switch(es)/circuit breaker(s) shall be labeled "EMERGENCY PUMP SHUTOFF".

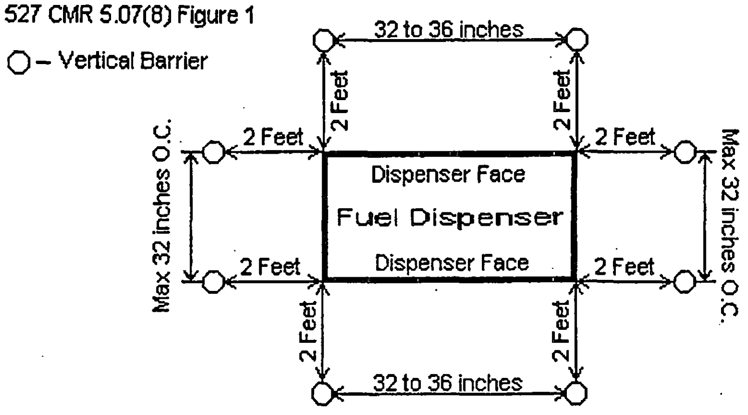
(6) Motor fuels shall be dispensed from tanks by means of fixed pumps designed and equipped to allow control of flow and prevent leakage or accidental discharge.

(7) Dispensing devices for motor fuels shall be listed. A control shall be provided that will permit the pump to operate only when a dispensing nozzle is removed from its bracket or normal position with respect to the dispensing device, and the switch on the dispensing device is manually activated. This control shall also stop the pump when all nozzles have been returned either to their brackets or to the normal non-dispensing position.

(8) Dispensing devices, except those attached to portable containers, shall:
(a) Be rigidly mounted.
(b) Be protected from vehicle damage by at least one of the following:
1. The dispensing device shall be mounted on a concrete platform at least six inches in height. Vertical barriers shall be installed at the ends of pumps.
2. The dispensing device shall be surrounded by vertical barriers. The barriers shall at all times prevent any contact between a vehicle and the dispensing device. Barriers must be installed at all corners of the dispenser. Each barrier must be located at least two feet off each side of each corner of the dispenser. On the side(s) of the dispensers having the dispenser face, a clear space of at least of 32 inches but no more than 36 inches must be maintained for accessibility. On the sides not having a dispenser face, the barriers shall not have a spacing that exceeds 32 inches on center. See 527 CMR 5.07(8): Figure 1.

5.07: continued

527 CMR 5.07(8) Figure 1



(9) Dispensing devices shall be equipped with an emergency shut off valve which is rigidly anchored and designed to close automatically in the event of fire or impact. Vapor return lines shall be installed so as to not inhibit the function of the liquid shut off valve. Emergency shut off valves shall be installed in accordance with the manufacturer's instructions, be tested after installation, and every year thereafter.

(10) On multiproduct dispensing units a listed emergency breakaway hose assembly designed to retain liquid on both sides of the breakaway point shall be installed on each hose dispensing motor fuels. Hose assemblies shall be installed and maintained in accordance with the manufacturer's instructions. 527 CMR 5.07 shall apply to all those installations or replacements after September 13, 1991.

5.08: Delivery

(1) No gasoline shall be delivered to or taken from a motor vehicle while the engine thereof is running. This does not apply to tank trucks making delivery by power.

(2) No gasoline shall be delivered to the tank of any motor vehicle from a storage tank except by means of a hose equipped with a listed self-closing nozzle which shall be held open manually while making delivery or by a listed automatic shut-off nozzle, and no such delivery shall be made except by the owner/operator or a duly authorized employee, except as otherwise provided in 527 CMR 5.08(5).

(3) No gasoline shall be delivered into a portable container having a maximum capacity of seven gallons or less which is not labeled in accordance with the pertinent provisions of 527 CMR 5.10(1). Nozzles used for dispensing gasoline into a portable container shall be manually held open during the dispensing operation.

(4) Portable containers shall not be filled while located inside any vehicle.

(5) The dispensing of motor fuel by means of self-service automated dispensing systems shall be permitted, provided that the applicant for such a system has submitted complete plans and specifications of the proposed installation to the Marshal accompanied by the required examination fee as authorized in M.G.L. c. 7, § 3B and has obtained approval of such plans, and further provided that there is compliance with the following:

FULL SELF-SERVE FACILITIES MAY BE ALLOWED PROVIDED THAT:
(a) The service station is under the control of the owner, operator, or duly authorized employee who shall be on duty at all times while motor fuel is being sold or dispensed.
(b) The motor fuel shall be dispensed only by a competent licensed motor vehicle operator or by the service station attendant.

5.08: continued

(c) Approved signs bearing the wording "Extinguish All Smoking Materials" and "Stop Engine While Refueling" shall be conspicuously posted at both ends of the pump dispensing island visible to approaching vehicles. All approved signs required by 527 CMR 5.00 shall consist of block letters not less than two inches in height and be either red letters on a white background or white letters on a red background.

(d) The controlling mechanism console providing power to the pump motor is in constant attendance by the owner, operator or duly authorized employee at all times while motor fuel is being dispensed and is properly protected against physical damage from motor vehicles. Constant attendance shall mean that the console operator must be at the console during its operation.

(e) There is constant contact between the controlling mechanism console operator and the pump island by means of an intercommunication system which shall be maintained in proper operating condition at all times while motor fuel is being dispensed.

(f) A means is provided for the controlling mechanism console operator to observe the filling operation at each vehicle, and the dispensing of motor fuel shall be continuously observed by the console operator during the time that any of the pumps have been activated to dispense motor fuel. Unrelated business (vending areas, convenience food marts, automotive repair garages, car washes, etc.) shall be operated by others.

EXCEPTION: Facilities of 1,000 square feet or less of retail sales area and eight or less fueling positions may be operated by one attendant at the discretion of the head of the fire department. Facilities of more than 1000 square feet of retail sales area and eight or less fueling positions may be operated by one attendant during non peak business hours after review by the head of the fire department and included as an addendum to plans submitted to and approved by the Marshal as described in 527 CMR 5.08(5). Non peak hours shall be determined based upon actual customer counts taken by the owner/operator during at least a 30 day period when the facility is operating. A non peak hour shall be any 60 minute period during which 12 or less customers purchase motor fuel. Records of customer counts and motor fuel sales and receipts shall be maintained by the owner/operator and shall be made readily available upon request of the Office of the State Fire Marshal and/or head of the fire department or his designee. Approved hours of non peak operation may be amended by the Marshal based upon periodic review of the facility records by the Marshal and/or the head of the fire department or his designee or at the request of the owner operator.

NOTE: Retail sales area shall not include storage areas, offices, restrooms, etc. but shall include the area of a facility which displays goods for sale including aisles and counter space.

(g) The controlling mechanism console includes a disconnect switch which will instantly cut off all pumping power to all motor fuel pumps at the service station.

NON-TEXT PAGE

5.08: continued

(h) The controlling mechanism console, switches and related equipment are of a design and type listed for use with the dispensing devices.

(i) Any person, firm, or corporation constructing a self-service facility or making changes or alterations, in the method of dispensing motor fuel, or to the preengineered fixed fire extinguishing system(s) other than normal maintenance, or to the self-service dispensing island arrangement(s) resulting in a change of hazard area protection, or environmental changes resulting in the inability of a console operator to constantly observe the fuel dispensing operation, shall notify the head of the fire department, in writing, prior to submitting plans to the Marshal.

(j) Self-service automated motor fuel dispensing systems for which plans have been submitted subsequent to June 20, 1975, shall be equipped with an overhead fixed fire extinguishing system of a type approved by the Marshal, details of which shall be included with plans submitted to the Marshal for approval.

(k) Hold open clips shall not be allowed on self-service dispensing nozzles.

EXCEPTION: Listed stage II vapor recovery nozzles that will only operate when the bellows assembly is compressed into the car fill pipe and will automatically shut off if the nozzle is removed from the fill pipe.

(l) The use of automatic credit card reading devices as a means of payment at the pump island shall be allowed provided that:

1. Each sale shall be individually authorized by the self-serve attendant;
2. The automatic credit card reading device shall not be used as physical authorization for the dispensing of motor fuel; and
3. The automatic credit card reading devices are included on plans submitted to and approved by the Marshal as described in 527 CMR 5.08(5)(i).

SPLIT ISLAND FACILITIES MAY BE ALLOWED PROVIDED THAT:

(m) There shall be installed on the full service islands an additional switch which will activate the overhead fire extinguishing system, and deactivate power to the self-service island dispensing pumps.

(n) Whenever the self-service dispensing mechanism is in operation, the service station operator shall be within visual range of the filling operation by either being at the controlling mechanism console as described in 527 CMR 5.08(5)(d) or at the full service pump island within 25 feet of the switch as defined in 527 CMR 5.08(5)(m).

(o) The split island facility meets all other applicable provisions of 527 CMR 5.08.

(6) The provisions of 527 CMR 5.00 and 527 CMR 14.00 shall not prohibit the dispensing of motor fuel in the open from a tank vehicle to a motor vehicle or other motorized equipment located at commercial, industrial, governmental, construction sites, or manufacturing establishments not open to the public, and intended for fueling vehicles used in connection with their businesses. Such dispensing shall be permitted provided:

(a) An inspection of the premises and operations has been made by the head of the fire department.

(b) A permit has been obtained by the owner/operator of the premises for such fueling operation from the head of the fire department of the city or town where the fueling is to take place. Such permit shall be granted provided the owner/operator of the fuel truck complies with 527 CMR.

(c) The head of the fire department may prescribe the conditions under which the fueling may be conducted.

(d) The tank vehicle operator or other competent person shall be in constant attendance at the dispensing nozzle during the filling operation and shall have a copy of the permit in his possession.

(e) The tank vehicle complies with the requirements of 527 CMR 8.00.

(f) The dispensing nozzle is a listed self-closing type without a hold-open clip.

(g) Deliveries shall be made in adequately lighted areas.

(h) The tank vehicle flashing lights shall be in operation while dispensing.

(i) Fuel expansion space shall be left in each tank being filled to prevent overflow in the event of temperature increases.

5.08: continued

(j) Smoking or the use of open flames within 25 feet of the fueling operation and related equipment shall be prohibited.
(k) Filling operations must be carried out in an outdoor area. Filling of vehicles inside of garages is prohibited.

5.09: Operation and Maintenance

(1) Any process conducted in conjunction with public garages involving volatile flammable solvents shall be segregated or located in a detached building or structure. No gasoline or Class I flammable fluid shall be used or kept in any open receptacle for cleaning or any other purpose.

(2) Suitable receptacles filled with nonflammable absorbent material, to be used in absorbing gasoline, waste oil or other such spills, shall be constantly kept on the floor of every garage having a net floor area of more than 1,000 square feet. Any contaminated absorbent material shall be disposed of in accordance with the requirements of 310 CMR.

(3) All garages shall be kept clean and shall be provided with a sufficient number of self-closing metal receptacles in which all combustible waste material shall be kept until removed from the building.

(4) A pit for greasing, lubricating, washing or wheel alignment purposes may be permitted, provided such pit is of sufficient area and so constructed as to permit ready escape therefrom in case of emergency. No such pit shall, in any case be used for repair purposes on gasoline powered vehicles.

(5) No person shall smoke in a garage, service station, or on the premises where gasoline or other motor fuels are sold or dispensed and notices to that effect, in block letters not less than two inches in height shall be conspicuously posted at the entrance to and within the garage or on said premises, and on each pump island visible to approaching vehicles; provided, however, that smoking may be allowed in a separate room as approved by the head of the fire department.

(6) No gasoline or other petroleum products shall be allowed to flow upon the floor of or into the drainage system of any garage.

(7) The painting of motor vehicles, or the application of flammable undercoating or other similar operations shall not be performed in the same room where motor vehicles are repaired, kept or stored, unless such operations are performed in a booth constructed of noncombustible material and provided with a mechanical ventilating system capable of keeping such booth free of flammable vapors. The use of dropped curtains to form a spray booth is not permitted.

(8) A fire extinguisher having a minimum classification of 4O-B:C shall be provided for every garage of 1,000 square feet of floor area and an additional fire extinguisher shall be provided for every additional 2,000 square feet of floor area. The maximum travel distance to reach such an extinguisher shall not exceed 50 feet. An extinguisher shall be located so that it will not be more than 75 feet from any pump, dispenser or fill-pipe opening. Extinguishers shall be located at the direction of the head of the fire department.

(9) Repair of motor vehicles using torch or flame. Cutting and welding using electric arcs or oxy-fuel gas flames shall be allowed in any garage provided that:
(a) All flammable fluids shall be stored in a separate room from the cutting or welding site.

5.09: continued

(b) All combustibles within a 35 foot radius horizontally from the work site shall be relocated from within said 35 foot radius area or shall be protected with flameproofed covers or otherwise shielded with metal or fire-resistant guards or curtains. Edges of covers at the floor shall be tight to prevent sparks from going under them.
(c) All floor drains within a 35 foot of the work site shall be covered with noncombustible material to prevent sparks or hot slag from entering them.
(d) A fully charged and operable fire extinguisher as provided in 527 CMR 5.09(8) shall be within 25 feet of the work site when any cutting and welding is being performed.
NOTE: For the purpose of 527 CMR 5.09 the work site shall be the immediate area where the cutting or welding is being performed.

5.10: General Provisions

(1) No person shall sell or offer for sale, advertise for sale, give, lease, or otherwise transfer for consideration or without consideration any container that has not been approved for the keeping, storage, use, handling, transportation or other disposition of flammable or combustible liquids. Approved containers shall include those built to U.S. DOT standards, listed and labeled by a NRTL, or approved by the State Fire Marshal.

(2) All garages and the manner of keeping, storing or using gasoline in connection therewith shall be subject to inspection by the State Fire Marshal, the head of the fire department or their designees.

(3) In the event of a leak, rupture, spill, overflow or other accident involving flammable liquids, the head of the fire department shall be notified immediately.

5.11: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 5.00 shall be considered a part of the requirements of 527 CMR 5.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 5.00: M.G.L. c. 148, §§ 9 and 10.

NON-TEXT PAGE

527 CMR 6.00: LIQUEFIED PETROLEUM GAS CONTAINERS AND SYSTEMS

Section

6.01: Purpose
6.02: Scope
6.03: Definitions
6.04: Approval of Equipment
6.05: Installation of Equipment - Compliance Requirements
6.06: Emergency Reporting Procedure and Equipment
6.07: Installation Standards and Procedures
6.08: Permits and Licenses

6.01: Purpose

The purpose of 527 CMR 6.00 is to provide minimum standards for LP-Gas systems for the protection and safety of the public at large.

6.02: Scope

(1) Effective as of November 1, 1983, 527 CMR 6.00 shall, except as provided in 527 CMR 6.02(3), apply to the design, construction, location, installation, and operation of LP-Gas systems.

(2) 527 CMR 6.00 shall not apply to the following:
(a) The transportation of liquefied petroleum gases over the highways in interstate or intrastate commerce;
(b) LP-Gas piping that is downstream of the first stage regulator and outside of buildings;
(c) The applications in 1-1.3 of NFPA 58, 1998 Edition.

(3) Existing systems installed before November 1, 1983, may be continued in service provided that their continued operation does not constitute a threat to health or safety.

6.03: Definitions

The following terms shall have the meanings assigned to them unless the context clearly indicates otherwise.

Abandoned. Any container without use, either filling or draw off of LP-Gas, for a continuous period in excess of 12 months.

Approved. Approved by the State Fire Marshal.

ASME. The American Society of Mechanical Engineers.

Container. Any vessel, including cylinders and tanks, used for storing LP-Gas.

Cylinder. A container having a capacity not exceeding 1,000 pounds (120 gallons) water capacity.

Equipment. The container or containers, major devices such as vaporizers, relief valves, excess flow valves, regulators, etc., and interconnecting piping.

Gallon. The U.S. standard gallon.

Installation. A LP-Gas system.

Identification Decal, Vehicle. A label or decal placed on a vehicle fueled by propane gas identifying such vehicle for the fire service (See 527 CMR 6.07(7)(j)).

6.03: continued

License. A license required by CMR 6.00 and issued by the local licensing authority after a hearing in accordance with the provisions of M.G.L. c. 148, § 13.

Liquefied Petroleum Gas, LP-Gas. Any material which is composed predominantly of any of the following hydrocarbons or mixtures of same: propane, propylene, butanes (normal or isobutane), and butylenes.

LP-Gas Systems. An assembly of one or more containers with a means of conveying LP-Gas from the container to dispensing or consuming devices (either continuously or intermittently) and which incorporates components intended to achieve control of quantity, flow or pressure in the liquid or vapor state.

Marshal. The State Fire Marshal.

Person. Any individual, firm, association, or corporation.

Permit. A permit required by CMR 6.00 and issued by the head of the fire department under authority of M.G.L. c. 148, § 10-A.

Portable Container. A USDOT or ASME container of not more than 1,000 pounds (120 gallons) water capacity.

Qualified Person. A person selected by an employer and trained to perform a specific task or duty involving LP-Gas, who has the degree of competency necessary to accomplish the work in a safe manner.

Shall. A mandatory requirement.

Tank. A container of more than 1,000 pounds (120 gallons) water capacity used for the storage or utilization of LP-Gas.

USDOT. The U.S. Department of Transportation.

Valve Plug. An approved device designed to be installed on a container valve outlet for the purpose of preventing the flow of gas through the outlet. The plug shall be rated for a minimum gas pressure of 250 psig.

Vendor. Any individual, firm, or corporation who sells, installs, or dispenses LP-Gas and/or related equipment.

Warning Label, Cylinder. A label or decal placed on a cylinder informing the user of certain precautions to take.

6.04: Approval of Equipment

(1) The head of the fire department shall approve all LP-Gas installations or the State Fire Marshal as herein provided.

(2) The approval of any equipment, container, or appliance shall be based on compliance with accepted principles or recognized engineering practice; and the Marshal may consider as approved any equipment, container, or appliance which meets the standards set up by any of the following organizations:

Underwriters Laboratories (UL)
National Fire Protection Association (NFPA)
Interstate Commerce Commission (ICC)
American Society of Mechanical Engineers (ASME)
American Petroleum Institute (API)
American Gas Association (AGA)
Factory Mutual Research Corporation (FM)

6.04: continued

Such equipment, container, or appliance shall bear some mark of identification to indicate the standard to which it conforms.

(3) LP-Gas installations having a product vapor pressure greater than that allowed for commercial propane each measured at 100°F shall be subject to approval by the Marshal.

(4) All parts of LP-Gas systems not specifically provided for in 527 CMR 6.00 shall be designed and constructed to provide a reasonable degree of safety.

6.05: Installation of Equipment - Compliance Requirements

(1) All LP-Gas systems shall be installed and maintained in accordance with the requirements of 527 CMR 6.00 except as provided in 527 CMR 6.02(3).

(2) No LP-Gas equipment shall be connected to any appliance that is not designed, constructed, or adapted for LP-Gas use.

(3) The owner of the storage equipment shall be responsible for the installation of the LP-Gas facility and for maintaining it in a safe operating condition.

(4) No person shall install, remove, connect, disconnect, fill or refill any LP-Gas container without permission of the owner of the container.

(5) Only a qualified person shall install, remove, connect, disconnect, sell, fill, refill, deliver or permit to be delivered, or operate any LP-Gas system utilizing containers of over 30 pounds (7.1 gallons) product capacity.

(6) The Marshal may order the user of a system to meet additional requirements:
(a) Where unusual conditions exist;
(b) When it necessary for the protection of life and property;
(c) Provided the additional requirements are within the intent and purpose of 527 CMR 6.00.

(7) An approved valve plug shall be installed on portable LP-Gas containers of 108 pound (12.9 gallon) water capacity (nominal 45 pound product capacity), or less, whether filled, partially filled, or empty (if they have been in LP-Gas service), as follows:
(a) At consumer sites or distributing points, but not connected for use;
(b) In storage for resale by dealer or reseller. (See NFPA 58-1998)

(8) A sign legibly marked, shall be posted stating: "MASSACHUSETTS STATE FIRE MARSHAL APPROVED VALVE PLUGS shall be installed on containers as required by 527 CMR 6.00."

6.06: Emergency Reporting Procedure and Equipment

(1) All LP-Gas installations exceeding 98 pounds (23 gallons) individual or aggregate water capacity shall be provided with a marker plate or sign indicating who should be called in the event of an emergency involving the LP-Gas installation. The marker or sign shall include the name and telephone number of the LP-Gas supplier, plant installer, owner, or operator who will respond to the emergency.

(2) The LP-Gas supplier, plant installer, owner or operator shall respond when notified of all LP-Gas emergencies occurring at his installation and shall maintain a 24-hour phone service.

6.07: Installation Standards and Procedures

(1) NFPA No. 58 Standards Adopted by Reference
(a) The standards prescribed by NFPA 58-1998 Edition entitled *Liquefied Petroleum Gas Code* are adopted as health and safety standards and shall apply according to their provisions, except that the NFPA Chapter 6 on Vehicular Transportation of LP-Gas and Section 3-2.5 Installation of Containers on Roofs of Buildings shall not apply.

6.07: continued

(b) Each person engaged in LP-Gas operations and equipment installation shall protect the public by complying with the NFPA 58-1998 standards prescribed by 527 CMR 6.07(1)(a).
(c) Where any conflict occurs between the standards prescribed in NFPA 58-1998 and the regulations in 527 CMR 6.00, 527 CMR 6.00 shall prevail.

(2) Container Markings
(a) All LP-Gas containers shall be legibly marked with recognized USDOT labels.
(b) User connected containers of 30 pounds (7.1 gallons) product capacity, or less, shall bear a "WARNING" label informing the user not to take the cylinder inside a building unless authorized by 527 CMR 6.00.

(3) Container Storage Outside of Buildings
(a) Permanent containers installed and refilled at an installation shall be installed outside of buildings, except as otherwise provided in 527 CMR 6.07(1)(a).
(b) Containers installed outside of buildings shall be located in accordance with NFPA 58-1998, Table 3-2.2.2, except that Note (b)(1) of Table 3-2.2.2 shall read:
1. DOT specification containers shall be located and installed so that the discharge from the container safety relief device is at least three feet horizontally away from any building opening below the level of such discharge, *a building opening is not within a three foot arc from the discharge of the container safety relief device*, and shall not be beneath any building unless this space is well ventilated to the outside and is not enclosed for more than 50% of its perimeter. The discharge from any container safety relief devices shall be located not less than five feet in any direction away from any exterior sources of ignition, openings into direct-vent (sealed combustion system) appliances, or mechanical ventilation air intakes. (Note: Words italicized do not appear in NFPA 58 (Note 527 CMR 6.07(3)(b)1.))
(c) Where there is a possibility of damage to storage systems from motor vehicles or other heavy objects, protection against such damage shall be provided.
(d) The tops of storage containers shall be in the same horizontal plane when the containers are interconnected by liquid piping.
(e) Storage located outside of buildings for cylinders awaiting use, resale, or part of a cylinder exchange point shall be located at least 20 feet from any doorway or opening in a building frequented by the public; 20 feet from any automotive service station fuel dispenser; and in accordance with NFPA 58-98 Section 5-4. The head of the fire department may increase the distances herein provided, where, in his opinion, conditions are such as to warrant such increases.
(f) Storage areas having containers awaiting use or resale shall be posted with adequate "NO SMOKING" and "FLAMMABLE GAS" or to indicate the contents, such as "FLAMMABLE GAS - PROPANE" or "FLAMMABLE GAS -BUTANE". Containers shall be stored within a suitable enclosure or otherwise protected against tampering.

(4) Underground Installation of Storage Containers
(a) ASME container assemblies listed for underground installation shall be installed as outlined in NFPA 58-1998 3-2.4.8 and as follows:
1. Precautions shall be taken to prevent damage to the container and the protective coating during handling. Any damage to the coating shall be repaired before backfilling.
2. Containers shall be set substantially level on a firm foundation (firm earth may be used) and surrounded by earth or sand firmly tamped in place. Backfill shall be free of rock or similar abrasives.
3. No underground container may be abandoned in place and any abandoned underground container must be removed by the tank owner under the direction of the Head of the Fire Department within a reasonable time.

(5) Container Storage Inside Buildings
(a) Storage or use of LP-Gas containers above the first floor of a building used for habitation is prohibited. This does not apply to motor vehicles with permanently mounted LP-Gas engine fuel containers. (Exception: The applications addressed in NFPA 58-1998 Section 3-4.1 and sections 3-4.3 through 3-4.8)

6.07: continued

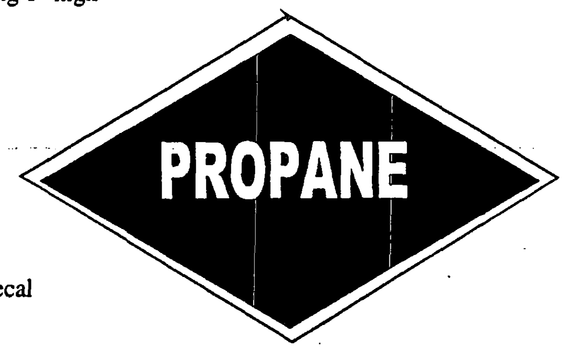
(b) Portable LP-Gas containers stored inside buildings in accordance with NFPA 58-1998, Section 3-4.1, 3-6.3.6, and Chapter 5 shall be considered as full containers for the purpose of determining the maximum quantities of LP-Gas permitted.
(c) Containers stored inside buildings shall not be near exits, stairways or in areas normally used or intended to be used for the safe egress of occupants.
(d) Containers of one pound product capacity, or less, used for torches, lanterns, and similar applications may be stored or displayed in a building frequented by the public provided the total quantity of product does not exceed 200 pounds and a permit has been issued by the Marshal. (See NFPA 58-1998 5- 3.1)
(e) Containers of one pound product capacity, or less, may be stored in buildings not frequented by the public and may exceed 300 pounds product capacity provided that the necessary precautions are taken as outlined in NFPA 58-1998 5-3 and a permit has been issued by the Marshal.
(f) The maximum quantity of LP-Gas stored in a building or room of special construction shall be 10,000 pounds. The building or room shall comply with NFPA 58-1998 5-3.2.1.
(g) Container storage areas shall have at least one portable fire extinguisher with a minimum of 20 pounds of dry chemical and a BC rating.
(h) Container storage areas shall be posted in compliance with 527 CMR 6.07(3)(e).

(6) Distributing Points, Distributing Plants, and Industrial Plants
(a) 527 CMR 6.07(6) shall apply to:
1. Distributing points of any capacity;
2. Distributing plants of any capacity; or
3. Industrial plants of 2,000 gallons aggregate water capacity or more.
(b) If loading or unloading is normally done during other than daylight hours, adequate lights shall be provided to illuminate storage containers, control valves, and other LP-Gas equipment.
(c) Suitable roadways or means of access for extinguishing equipment, such as wheeled extinguishers or fire department apparatus, shall be provided.
(d) The LP-Gas system shall be enclosed within an industrial type fence at least six feet high with at least two egress gates opening outward and remotely located from each other, or be within an approved fence plant area and protected from tampering.
(e) The LP-Gas system shall be protected against vehicle damage, with substantial bumper guards where necessary.
(f) The storage, loading, unloading, cylinder and vehicle filling areas, and other strategic points shall be adequately posted in accordance with 527 CMR 6.07(3)(e).
(g) Only a qualified person shall dispense LP-Gas into any LP-Gas container.
(h) Before any portable container can be filled at a vendor site, the qualified operator shall make a careful examination of every container each time it is to be filled and the container shall be rejected if:
1. There is evidence of exposure to fire, bad gouges or dents, seriously corroded areas, leaks, or other conditions indicating possible weakness which might render it unfit for service, or
2. the cylinder is more than 12 years old and has not been requalified in accordance with DOT regulations.
(i) Before a container mounted on a vehicle is filled, the vehicle engine shall be shut off and all sources of ignition, such as pilot lights, smoking materials, etc., within the immediate area shall be extinguished.
(j) Storage outside of buildings for cylinders awaiting use, resale or exchange shall comply with NFPA 58-1998 5-4, the head of the fire department may increase the distances as herein provided.

(7) Vehicle Fuel Dispensers.
(a) Vehicle fuel dispensers shall comply with NFPA 58-1998 3-9, and shall be approved by the Marshal prior to operation.
(b) "NO SMOKING" and "STOP ENGINE WHEN REFUELING" signs shall be displayed at the filling station. The signs shall have block letters at least two inches high with either red letters on a white background or white letters on a red background.

6.07: continued

(c) Every motor vehicle powered by propane gas shall bear a reflective decal. The decal shall be placed on an exterior vertical or near-vertical surface on the lower right rear of the vehicle but not on the bumper inboard from any other markings. A vehicle may have additional decals. Decal shall be of the following shape:



Silver Schotchlite lettering 1" high

Black background

Silver Scotchlite border

Vehicle Identification Decal

6.08: Permits and Licenses

(1) Installation and Inspection

(a) No person shall install or connect any LP-Gas equipment unless a permit to install LP-Gas has been obtained from the head of the fire department.

No permit shall be required, however, to make a connection in the replacement of a portable container, or the filling of a stationary container.

(b) Application for a permit to install LP-Gas shall be made in the name of the owner or occupant of the premises by the person, firm, or corporation who will make the installation or connection. If the aggregate amount of LP-Gas to be stored exceeds 2,000 gallons, then a license as required by 527 CMR 6.08(2)(b) must first be obtained and a copy of the license shall be submitted with the application for a permit to install LP-Gas. If any one tank for the storage of LP-Gas exceeds 10,000 gallons, then the requirements of 520 CMR 12.00 must be complied with and documentation of compliance with 520 CMR 12.00 shall be submitted with the application for a permit to install LP-Gas.

(c) The head of the fire department may limit the quantity of LP-Gas that may be stored under a permit or order the installer of a system to meet additional requirements:

1. Where unusual conditions exist;
2. When it necessary for the protection of life and property;
3. Provided the additional requirements are within the intent and purpose of 527 CMR 6.00.

(d) Upon completion of an installation or connection authorized by a permit to install LP-Gas, the person, firm or corporation having made the installation or connection shall certify in writing on a form approved by the Marshal to the head of the fire department that the work has been completed, and in conformity with the requirements of 527 CMR 6.00.

(e) Upon receipt of such certification of completion, the head of the fire department shall make an inspection of the installation within a reasonable time; and if same is found to be in accordance with 527 CMR 6.00, he shall issue to the owner or occupant a permit for the keeping, storage, manufacture or sale LP-Gas in connection therewith, except where such storage is otherwise authorized by license; provided however, that if such installation is found not to be in accordance with 527 CMR 6.00, the permit shall be withheld and shall not be issued until the proper corrections have been made as directed, by written notice if requested, within a reasonably specified time and prior to any LP-Gas being stored in the container(s).

(2) Storage License or Registration

(a) No person shall keep or use any LP-Gas, or install or connect any LP-Gas equipment to any appliance except in accordance with the requirements of 527 CMR 6.00.

6.08: continued

(b) In accordance with the provisions of M.G.L. c. 148, § 13, 2,000 gallons of LP-Gas, in the aggregate, is hereby prescribed as the maximum amount that may be kept, stored, manufactured or sold, in one or more containers without a license or registration, or either of them, provided that a permit for the keeping, storage, manufacture or sale of LP-Gas has been obtained, except as hereinafter provided for.

(c) When more than 2,000 gallons of LP-Gas will be stored, manufactured or sold, a license shall first be obtained from the local licensing authority by the owner or occupant of the premises in accordance with the provisions of M.G.L. c. 148, § 13.

(d) The permit for the keeping, storage, manufacture or sale of LP-Gas must be obtained from the head of the fire department as provided by M.G.L. c. 148, §§ 10A and 23.

(e) No permit will be required for the storage and use of an amount less than 42 pounds (ten gallons), provided that the provisions of 527 CMR 6.01 through 6.07 shall apply.

(f) The permit for the keeping, storage, manufacture or sale of LP-Gas may be revoked by the head of the fire department as provided by M.G.L. c. 148, §§ 10A and 23, if the installation is changed or modified in any way or of the provisions of 527 CMR 6.00 are not complied with.

REGULATORY AUTHORITY

527 CMR 6.00: M.G.L. c. 22, § 14; c. 148, §§ 9, 10 and 28.

NON-TEXT PAGE

527 CMR 7.00: MANUFACTURE AND HANDLING OF PLASTICS

Section

7.01: Adoption by Reference
7.02: Referenced Publications

7.01: Adoption by Reference

The following NFPA standards are adopted by reference for the manufacture, storage, handling and use of plastics.

(1) NFPA 35, Standard for the Manufacture of Organic Coatings.

(2) NFPA 40, Storage and Handling of Cellulose Nitrate Motion Picture Film

(3) NFPA 40E, Code for the Storage of Pyroxylin

(4) NFPA 231, Standard for General Storage

(5) NFPA 231C, Standard for Rack Storage Materials

(6) NFPA 654, Standard for the Prevention of Fire and Dust Explosions in the Chemical, Dye, Pharmaceutical, and Plastics Industries.

7.02: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 7.00 shall be considered a part of the requirements of 527 CMR 7.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 7.00: M.G.L. c. 148, § 10.

(PAGES 73 THROUGH 76 ARE RESERVED FOR FUTURE USE.)

527 CMR 8.00: TRANSPORTATION OF FLAMMABLE AND COMBUSTIBLE LIQUIDS

Section

8.01: Purpose and Scope
8.02: Definitions
8.03: Transportation of Flammable and Combustible Liquids
8.04: Permits
8.05: Marking and Placarding of Cargo Tanks
8.06: Marking and Placarding of Portable Tanks
8.07: Cargo Tanks
8.08: Double Bulkheads
8.09: Accident Damage Protection
8.10: Closures For Manholes
8.11: Outlets
8.12: Static Protection
8.13: Lighting
8.14: Exhaust System
8.15: Fire Extinguishers
8.16: Auxiliary Internal Combustion Engines
8.17: Auxiliary Electric Generators and Motors
8.18: Filling and Discharging Tank Vehicles
8.19: Asphalt Tank Vehicles
8.20: Transportation by Transfer Tanks
8.21: General
8.22: Referenced Publications

8.01: Purpose and Scope

(1) 527 CMR 8.00 shall apply to the transportation of combustible liquids, by Massachusetts registered motor vehicles, in cargo tanks, portable tanks and transfer tanks by transport vehicles, and flammable liquids in non-bulk packagings not exceeding seven gallons capacity. The intent of 527 CMR 8.00 is to protect the public safety and welfare from the danger of fire due to tank or container leakage of flammable or combustible liquids, and is in addition to any requirements of the U.S. Department of Transportation, (DOT) Title 49 CFR.

(2) The transportation of flammable liquids shall be in accordance with U.S. Department of Transportation, (DOT) Title 49 CFR.

(3) All cargo tanks, portable tanks, and transfer tanks, are to be considered full for the purpose of permitting required under 527 CMR 8.00.

8.02: Definitions

(1) For the purpose of 527 CMR 8.00, the following terms shall have the meanings respectively assigned to them:

Approved. Approved by the Marshal.

Cargo Tank. Any container having a liquid capacity of 119 gallons or more intended primarily for the carriage of flammable or combustible liquids, including appurtenances, reinforcements, fittings, and closures and which:

(a) is permanently attached to or forms a part of a motor vehicle, or is not permanently attached to a motor vehicle but which by reason of its size, construction or attachment to a motor vehicle is loaded or unloaded without being removed from the motor vehicle; and
(b) is not fabricated under a DOT specification for portable tanks; and
(c) does not solely supply fuel for the propulsion of the transport vehicle upon which it is mounted.

Combustible Liquid. Any liquid having a flash point at or above 100°F shall be known as a Class II or Class III Liquid. Combustible liquids shall be divided into the following classifications:

8.02: continued

Class II: Liquids having flash points at or above 100°F and below 140°F.
Class IIIA: Liquids having a flash point at or above 140°F and below 200°F.
Class IIIB: Liquids having a flash point at or above 200°F.

Compartment. A liquid-tight division of a cargo tank.

Department. Department of Fire Services or Department of State Police.

Flammable Liquid. Any liquid having a flash point below 100°F (38°C) and having a vapor pressure not exceeding 40 psia at 100°F.

Marshal. The State Fire Marshal.

Nationally Recognized Testing Laboratory (NRTL). An organization which tests for safety and lists, labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00: *Appendix C*.

Person. Any person, firm or corporation.

Portable Tank. Any container designed primarily to be loaded onto, or on, or temporarily attached to a transport vehicle and equipped with skids, mountings, or accessories to facilitate handling of the tank by mechanical means.

Tank Semi-Trailer. Any vehicle, with or without auxiliary motive power, equipped with a cargo tank mounted thereon or built as an integral part thereof, and used for the transportation of flammable or combustible liquids, and so constructed that, when drawn by a tractor by means of a fifth wheel connection, some part of its load and weight rests upon the towing vehicle.

Tank Truck. Any single self-propelled motor vehicle equipped with a cargo tank mounted thereon, and used for the transportation of flammable or combustible liquids.

Tank Vehicle. Any tank truck or tractor and tank semi-trailer combination equipped with a cargo tank mounted thereon or built as an integral part thereof, used for the transportation of flammable or combustible liquids.

Tractor. A self-propelled motor vehicle designed and used primarily for drawing other vehicles and not so constructed as to carry a load other than a part of the weight of the vehicle and load so drawn.

Transfer Tank. Any container having a liquid capacity of less than 119 gallons into which combustible liquids are loaded, and drawn out by means of a pump assembly.

Transport Vehicle. Any vehicle such as an automobile, van, truck, tractor or semi-trailer, or any combination thereof, propelled or drawn by mechanical power and used upon the highways in the transportation of passengers and property.

Unattended. Any transport vehicle parked without the driver present for more than four hours.

8.03: Transportation of Flammable and Combustible Liquids

(1) No person shall transport by cargo tank or transport vehicle, any combustible liquid within the Commonwealth unless such liquid is transported in accordance with the requirements of 527 CMR 8.00. No person shall transport by cargo tank or transport vehicle, any flammable liquid unless such liquid is transported in accordance with U.S. DOT, Title 49 CFR.

(2) Transport vehicles used in the transportation of flammable or combustible liquids as herein provided for shall be subject to inspection by any member of the Department, the head of the fire department or his designee.

8.03: continued

(3) No person shall deliver any flammable or combustible liquid by any vehicle, except to transfer to another vehicle, unless the person, firm, or corporation receiving such liquids exhibits a permit/license for the storage of such liquids.

8.04: Permits

(1) No cargo tank, portable tank or transfer tank shall be used for the transportation of any combustible liquid unless that tank has been approved and a permit to transport combustible liquids issued therefore by the Marshal.

(2) Application for approval of a cargo tank, portable tank or transfer tank shall be made to the Marshal on a form furnished by the Department giving such information in full as requested, containing the address of the permitted land in accordance with 527 CMR 8.04(5) where the vehicle is parked overnight or such other information as he may deem necessary. Upon satisfactory proof of assurance that the tank has been designed and mounted in accordance with 527 CMR 8.00, the head of the fire department in the city or town of where the vehicle is parked overnight shall issue a permit to transport combustible liquids.

(3) The permit to transport provided in 527 CMR 8.04 shall serve as a permit to transport combustible liquids for a period not to exceed two years. All permits to transport shall expire on August 31, 1994, and each even numbered year thereafter.

(4) Permits to transport shall consist of a decal to be affixed to the upper left quadrant of the cargo tank, portable or transfer tank and a valid form FP 44 PERMIT which shall be carried in the transport vehicle at all times.

(5) No cargo tank, portable tank, or transfer tank, shall be unattended unless a permit has been obtained from the head of the fire department as provided by M.G.L. c. 148, §§ 10A and 23. All cargo tanks, portable tanks, and transfer tanks, for which a permit has been granted under 527 CMR 8.04 shall only be left unattended in an area remote from buildings of habitation, in such a manner as the head of the fire department may prescribe.

(6) Tank vehicles transporting combustible liquids in specification containers in accordance with U.S. (DOT) Title 49 CFR for flammable liquids, shall be exempt from 527 CMR 8.04(1) through (4) provided a certificate of exemption has been obtained from the head of the fire department.

(7) Application for a certificate of exemption shall be on a form furnished by the Department giving such information in full as requested, containing the address of the permitted land in accordance with 527 CMR 8.04(5) where the vehicle is parked overnight. The person making application for a certificate of exemption shall affirm the tank vehicle meets the specifications for transporting flammable liquids in accordance with U.S. DOT, Title 49 CFR. Upon receipt of an application and affirmation for certificate of exemption, the head of the fire department, in the city or town where the vehicle is parked overnight, shall issue said certificate.

(8) Certificates of exemption shall be carried in the transport vehicle at all times and shall remain in effect provided the tank vehicle is maintained in accordance with U.S. DOT, Title 49 CFR, specification for transporting flammable liquids.

8.05: Marking and Placarding of Cargo Tanks

(1) All cargo tanks transporting combustible liquids shall be marked on each side and each end with the United Nations (UN) hazardous material identification number specified for the material being transported.

(a) Except as provided in 527 CMR 8.05(3), identification numbers shall be displayed on orange panels 6¼ inches high by 15¾ inches wide with a 9/16 inch black outer border. The identification number shall be displayed in four-inch black Helvetica Medium numerals on the orange panel; or

8.05: continued

(b) On plain white square-on-point display configurations having the same outside dimensions as a placard, located in association with the required placards. The identification number shall be displayed across the center area of the panel in 3½ inch black Alpine Gothic or Alternate Gothic No. 3 numerals four inches high and approximately 8½ inches wide and may be outlined with a solid or dotted line border. An identification number displayed on a square-on-point display configuration is not considered to be a placard.

(2) For cargo tanks used to transport flammable and/or combustible liquid petroleum distillate fuels the hazardous material identification number of the flammable liquid may be used.

(3) Every cargo tank used for the transportation of any combustible liquid, regardless of the quantity being transported, shall be conspicuously and legibly marked on each side and each end with a square-on-point red placard measuring 10¾ inches on each side, the outer ½ inch of which must be white, bearing the hazardous material identification number of the contents in 3½ inch black numerals on a white background four inches high, and the configuration of a flame, or the word "COMBUSTIBLE" in white letters and a white symbol in the configuration of a flame. The words "FUEL OIL" may be used in place of the word "COMBUSTIBLE" on those cargo tanks used exclusively for the transportation of fuel oil.

(a) If the words "FUEL OIL" are used on a placard to identify the material being transported, the identification number need not be displayed.

(b) When an identification number is displayed on a placard the UN hazard class number for that material shall be displayed in the lower corner of each placard.

(4) Each cargo tank which is required to be marked or placarded in accordance with 527 CMR 8.05 must remain marked and placarded when empty unless it is:

(a) Reloaded with a material not subject to 527 CMR 8.00; or

(b) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.

(5) Cargo tanks transporting Class IIIB combustible liquids shall be exempt from the provisions of 527 CMR 8.05(1) through (4)

8.06: Marking and Placarding of Portable Tanks

(1) Every portable tank used for the transportation of any combustible liquid shall be marked with letters or numerals in accordance with 527 CMR 8.05 on each side and each end, if the tank has a capacity of 1000 gallons or more, or on two opposing sides if the tank has a capacity of less than 1000 gallons.

(2) If the markings required by 527 CMR 8.05(1) are not visible, the transport vehicle or freight container used to transport a portable tank must be marked on each side and each end in accordance with 527 CMR 8.05.

(3) A portable tank marked with the name or identification number of a hazardous material may not be used to transport any other material unless the marking is removed, or changed to identify the material in the portable tank, whichever is appropriate.

(4) Each portable tank which is required to be marked or placarded in accordance with 527 CMR 8.06 must remain marked and placarded when empty unless it is:

(a) Reloaded with a material not subject to 527 CMR 8.00; or

(b) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.

8.07: Cargo Tanks

(1) Cargo tanks with frames not made integral with the tanks as by welding, shall be provided with restraining devices to eliminate any relative motion between the tank and frame which may result from the stopping, starting or turning of the vehicle. Such restraining devices shall be readily accessible for inspection and maintenance; except insulation and jacketing may cover the restraining devices for insulated cargo tanks.

8.07: continued

(2) Any cargo tank designed and constructed so that it constitutes in whole or in part the structural member used in lieu of a frame, shall be supported in such a manner that the resulting stress levels in the cargo tank do not exceed 20% of the minimum ultimate strength of the material used in construction, except when ASME Code pressure vessel design requirements apply.

(3) Cargo tanks shall be securely fastened to the chassis or other running gear.

(4) Tanks, piping, and connections shall be constructed of suitable materials and in accordance with good engineering practice. The U.S. Department of Transportation (DOT) standards for materials and construction and the National Fire Protection Association (NFPA) recommended standards for materials and construction are considered by the Board as conforming to good engineering practice.

(5) Cargo tanks of 500 gallons capacity or less shall be constructed of not less than 12 USS gauge standard open hearth steel tank plate and otherwise constructed to withstand any additional stress to which they may reasonably be subjected.

8.08: Double Bulkheads

(1) Cargo tanks designed to transport different commodities which if combined during transit will cause a dangerous condition or evolution of heat or gas shall be provided with compartments separated by an air space. This air space shall be vented and be equipped with drainage facilities which shall be kept operative at all times.

8.09: Accident Damage Protection

(1) Each cargo tank shall be provided with a rear bumper or device to protect the tank and piping in the event of a rear end collision and to reduce the likelihood of damage which could result in the loss of product. The rear bumper or device shall:

(a) Extend at least four inches below the lower surface of any valve, fitting, or piping at the rear of the tank;

(b) Be located so that the clearance between the effective bottom of the bumper or device and the ground shall not exceed 30" with the vehicle empty;

(c) If more than one bumper or device is used the distance between the closest points shall not exceed 24";

(d) Be located so that the widest part of the motor vehicle at the rear shall not extend more than 18" beyond the outermost ends of the bumper, device or devices (if separated) on either side of the vehicle;

(e) Be substantially constructed and firmly attached to the vehicle frame.

8.10: Closures for Manholes

(1) Each compartment shall be accessible through a 15-inch minimum inside diameter manhole. The manhole cover shall be designed to provide a secure closure of the manhole. All joints between manhole covers and their seats shall be made tight against leakage of vapor and liquid. Gaskets, if used, shall be of suitable material not subject to attack by the product.

8.11: Outlets

(1) Bottom outlet product discharge piping shall be provided with protection in such a manner as to reasonably assure against the accidental escape of the product. Such protection must be provided by:

(a) A shear section located outboard of each valve seat and within four inches of the vessel which will break under strain and leave the valve seat and its attachment to the vessel and the valve head intact and capable of retaining the product. The shear section shall be machined in such a manner as to abruptly reduce the wall thickness of the adjacent piping (or valve) material by at least 20% or

8.11: continued

(b) Suitable guards capable of absorbing a concentrated horizontal force of at least 8,000 pounds applied from any horizontal direction, without damage to the discharge piping which will adversely affect the product retention integrity of the discharge valve.

The provisions of 527 CMR 8.11(1) shall be met by retrofitting cargo tanks transporting combustible liquids covered by 527 CMR 8.00 as follows:
30% of cargo tank fleet not meeting these provisions by August 31, 1994;
60% of cargo tank fleet not meeting these provisions by August 31,1996;
100% of cargo tank fleet not meeting these provisions by August 31, 1998;

(2) Internal valves in product discharge piping shall be kept in working order and shall be closed while the vehicle is in transit.

(3) Product discharge piping and appurtenances shall be located not less than 12" above the road.

(4) All draw-off valves or faucets of cargo tanks on tank vehicles shall be so designed that a tight hose connection can be made thereto and shall be adequately protected against injury.

(5) A delivery hose, when attached to a tank vehicle, shall be considered as being part of the tank vehicle.

(6) Draw-off valves on tank vehicles shall be self-closing and, when opened for the purpose of discharging liquid, such valves shall be held open manually except where a tight hose connection is made to the inlet of the receiving container.

8.12: Static Protection

(1) Cargo tanks and vehicle chassis shall be electrically bonded. No chain or other metal attached to a tank vehicle shall be permitted to drag upon the ground.

(2) Provision shall be made in the tank structure of the vehicle for the bonding of the vehicle to the fill pipe during truck-loading operations.

8.13: Lighting

No lighting device other than electric lights shall be used on tank vehicles. Lighting circuits shall have suitable over-current protection (fuses or automatic circuit breakers). The wiring shall have current carrying capacity and mechanical strength, and shall be secured, insulated, and protected against physical damage, in keeping with recognized good practice.

8.14: Exhaust System

(1) The exhaust system, including muffler and exhaust line shall have ample clearance from the fuel system and combustible materials, and shall not be exposed to leakage or spillage of the product or accumulations of grease, oil or gasoline.

(2) The exhaust system, including all units, shall be constructed and installed in a workmanlike manner.

8.15: Fire Extinguishers

Each tank vehicle shall be equipped and maintained with one or more hand fire extinguishers of combined 2A, 20-B, C rating. Ratings shall be in accordance with the Standard for the Installation of Portable Fire Extinguishers, NFPA No. 10. Fire extinguishers shall be kept in good operating condition at all times, and they shall be located in an accessible place on each tank vehicle.

8.16: Auxiliary Internal Combustion Engines

Internal combustion engines, other than those providing propulsive power, installed or carried upon a tank vehicle transporting combustible liquids for the purpose of providing power for the operation of pumps or other devices, shall meet the following requirements:

(1) The engine air intake shall be equipped with an effective flame arrester, or an air cleaner having effective flame arrester characteristics, substantially installed and capable of preventing emission of flame from the intake side of the engine in the event of backfiring.

(2) The fuel system shall be so located or constructed as to minimize the fire hazard. If the fuel tank is located above or immediately adjacent to the engine, suitable shielding shall be provided to prevent spillage during the filling operation or leakage from the tank or fuel system from coming in contact with the engine or any parts of the ignition and exhaust systems. All parts of the fuel system shall be constructed and installed in a workmanlike manner.

(3) Pumps and other appurtenances carrying or containing combustible liquids shall be so located in relation to the engine that spillage or leakage from such parts shall be prevented from coming in contact with the engine or any parts of the ignition and exhaust system, or adequate shielding shall be provided to attain the same purpose. The engine cooling fan shall be so positioned, rotated or shielded as to minimize the possibility of drawing flammable vapors toward the engine.

(4) When the engine is located in a position where spillage from the cargo tank or its appurtenances or from side racks might constitute a hazard, suitable shielding shall be provided to prevent such spillage from contacting the engine or engine exhaust system and for draining such spillage away from the vicinity of the engine.

(5) Where the engine is carried within an enclosed space, adequate provision shall be made for air circulation at all times to prevent accumulation of flammable vapors and to avoid overheating.

(6) The exhaust system shall be substantially constructed and installed and free from leaks. The exhaust line and muffler shall have adequate clearance from combustible materials and the exhaust gases shall be discharged at a location which will not constitute a hazard. When engines are carried as in 527 CMR 8.16(1)(e), the exhaust gases shall be discharged outside of each such enclosed space.

(7) The ignition wiring shall be substantially installed with firm connections and spark plug and all other terminals shall be suitably insulated to prevent sparking in the event of contact with conductive materials. The ignition switch shall be of the enclosed type.

8.17: Auxiliary Electric Generators and Motors

Electrical equipment installed or carried upon a tank vehicle transporting combustible liquids for the operation of pumps or other devices used for the handling of product and operating product handling accessories shall meet the following requirements:

(1) Electric generators driven from a power-take-off connected to the vehicle transmission or to an auxiliary transmission, or by an auxiliary internal combustion engine, shall be of the explosion-proof type.

(2) Electric motors shall be of the explosion-proof type.

(3) Wiring shall be adequate and substantially installed with all terminals firmly connected and insulated to prevent sparking from vibration or in the event of contact with conductive materials. Wires shall have oil-proof insulation. If overload protection is provided, it shall be of the explosion-proof type. All switches or other sparking devices shall be of the explosion-proof type and all conduit entrances shall be sealed.

8.17: continued

(4) Where the generator or motor is located within an enclosed space adequate provision shall be made for air circulation to prevent overheating and possible accumulation of flammable vapors.

(5) Electrical equipment and wiring shall be so located as to prevent contact with spillage from cargo tank or side racks or suitable shielding shall be provided to attain equivalent protection.

8.18: Filling and Discharging Tank Vehicles

(1) The driver, operator or attendant of any tank vehicle shall not leave the vehicle while it is being filled or discharged.

(2) The cargo tank shall be bonded to the grounded fill pipe when loading. The bond-wire connection shall be made prior to opening the dome covers. It shall be maintained in place during the entire filling operation and the dome covers shall be securely closed before the bond-wire is disconnected from the cargo tank.

(3) No cargo tank or compartment thereof used for the transportation of any flammable or combustible liquid shall be loaded liquid full. The vacant space (outage) in a cargo tank or compartment thereof used in the transportation of flammable or combustible liquids shall be not less than 1%; sufficient space (outage) shall be left vacant in every case to prevent leakage from or distortion of such tank or compartment by expansion of the contents due to rise in temperature in transit.

(4) The driver, operator or attendant of any tank vehicle shall be trained in the proper method of loading and unloading of tank vehicles. No storage tank shall be filled until the delivery operator has determined tank ullage (available capacity) to prevent overfilling.

8.19: Asphalt Tank Vehicles

(1) The outlets of each cargo tank used for the transportation of liquids having a viscosity equal to or greater than 45 seconds Saybolt Universal at 100°F. shall be equipped with a suitable shutoff valve, located internally and designed so that the valve will remain operable if the external connection is sheared off, or shall be equipped with a front or rear-head mounted valve securely reinforced and protected against shock or road hazards.

(2) Each cargo tank used in asphalt service shall be provided with a vent having an effective opening at least equivalent to a nominal two-inch pipe.

(3) Overflow protection for asphalt tank vehicles shall be provided in the form of reservoirs or flashing around fill and vent pipes. Overflow and drain pipes shall have thicknesses heavier than the tank shell and shall be designed so that hot asphalt will not spill onto tires, brakes, burner equipment or the vehicle's exhaust system.

(4) Cargo tanks shall be free of all water before they are loaded with hot asphalt.

(5) Burner tubes shall be properly installed and maintained.

(6) The bottom of internal burner tubes shall be located as low in the tank as proper design and functioning will permit.

(7) Instructions for the proper method of operating the burner equipment and the pumping equipment, if so equipped, shall be provided. These instructions shall accompany the vehicle at all times.

(8) A legible red warning sign shall be permanently attached near the burners on any tank vehicle equipped with burners and shall contain at least the following information:

8.19: continued

"WARNING

This burner equipment must not be operated while the vehicle is being loaded or is in transit, or when the burner tubes are not completely submerged."

8.20: Transportation by Transfer Tanks

Vehicles other than approved tank vehicles may transport combustible liquids in transfer tanks provided that an application has been made and a permit to transport has been issued in accordance with 527 CMR 8.04. The vehicle shall be approved for the transportation of the combustible liquid provided that:

(1) The tank is securely mounted to the vehicle body or truck bed and its capacity does not exceed 119 gallons;

(2) The tank shall be constructed of not less than 14 USS gauge standard open hearth steel tank plate or ⅛ inch aluminum and otherwise constructed to withstand any additional stress to which it may reasonably be subjected;

(3) The liquid is drawn only from the top of the tank by means of a suitable pump to which is attached a durable hose equipped with a self-closing nozzle.

(4) All openings in the tank are secured by plugs or caps maintained wrench tight while the vehicle is in transit.

(5) The vehicle is equipped with a fire extinguisher having a rating of at least 1A, 10B, C.

8.21: General

(1) No cargo tank, portable tank or transfer tank shall be mounted in the bed or body of any vehicle which contains a hoist to raise such bed or body.

(2) Tank vehicles shall not be operated unless they are in proper repair, devoid of accumulations of grease, oil, or other combustibles, and free of leaks.

(3) Smoking by tank vehicle drivers, helpers, repairmen, or other personnel is prohibited while they are driving, making deliveries, filling, or making any repairs to tank vehicles.

(4) No cargo tank vehicle loaded with flammable or combustible liquids as defined in 527 CMR 8.00 shall be left unattended for over one hour unless the driver notifies the head of the fire department in the city or town in which the vehicle is parked. The head of the fire department may assume control of the vehicle and its contents if the owner is unable or unwilling to remove the vehicle or its contents within a reasonable time.

(5) Any flammable or combustible liquid transported by other than cargo tank, portable tank or transfer tank shall be transported in approved containers, substantial metal drums or other similar containers, with all openings tightly closed, and in an upright and secured postition. Gasoline or other flammable petroleum product may be transported without a permit in any open vehicle or in a compartment of a closed vehicle separated from the passengers, in total quantity not to exceed 21 gallons, provided such flammable liquid is contained in approved containers with no individual container exceeding seven gallons capacity. Combustible liquids may be transported without a permit in any open vehicle or in the compartment of a closed vehicle separated from the passengers, in total quantity not to exceed 55 gallons, provided such combustible liquid is contained in approved containers, substantial metal drums or other similar containers. Approved containers shall include those built to DOT standards, listed and labeled by a NRTL, or approved by the State Fire Marshal.

(6) All containers of one quart capacity or more, used in accordance with the provisions of 8.21(5), shall bear a label with the words "DANGER - KEEP AWAY FROM FIRE" or similar wording, in letters not less than ½ inch in height.

8.21: continued

(7) No person shall sell, offer for sale, advertise for sale, give, lease, or otherwise transfer for consideration or without consideration any container that has not been approved for the keeping, storage, use, handling, transportation or other disposition of flammable or combustible liquids. Approved containers shall include those built to DOT standards, listed and labeled by a NRTL, or approved by the State Fire Marshal.

(8) In accordance with the provisions of M.G.L. c. 148, § 9, the Board hereby prescribes, as the maximum amount, 15,000 gallons of flammable liquid in the aggregate which may be stored unattended within cargo tanks, portable tanks or transfer tanks on a parcel of land without a license or registration or either of them, provided a permit has been obtained therefore. 527 CMR 8.21(8) shall not apply to parcels of land permitted by the head of the fire department prior to September 1, 2008.

(9) In accordance with the provisions of M.G.L. c. 148, § 9, the Board hereby prescribes, as the maximum amount, 15,000 gallons of Class II combustible liquid in the aggregate which may be stored unattended within cargo tanks, portable tanks or transfer tanks on a parcel of land without a license or registration or either of them, provided a permit has been obtained therefore. 527 CMR 8.21(9) shall not apply to parcels of land permitted by the head of the fire department prior to September 1, 2008.

(10) The head of the fire department may limit the quantity of flammable and combustible liquids, that may be stored unattended, on a parcel of land, to less than those amounts specified in 572 CMR 8.21(8) and 8.21(9), under the authority of a permit where, in his opinion, conditions are such to warrant his restricting such amounts.

(11) Whoever violates the provisions of 527 CMR 8.00 shall be subject to the penalties stated in M.G.L. c. 148, § 15.

8.22: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 8.00 shall be considered a part of the requirements of 527 CMR 8.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 8.00: M.G.L. c. 148, §§ 9, 10 and 28; c. 22D, § 4.

527 CMR 9.00: TANKS AND CONTAINERS

Section

9.01: Purpose and Scope
9.02: Definitions
9.03: Aboveground Storage Tanks Greater Than 10,000 Gallons Capacity or Tanks Storing Combustible Liquids
9.04 Aboveground Storage Tanks Equal to or Less Than 10,000 Gallons Capacity For Storing Class I Liquids
9.05: Underground Storage Tanks
9.06: Waste Oil Storage Tanks
9.07: General Provisions
9.08: Referenced Publications

9.01: Purpose and Scope

(1) 527 CMR 9.00 shall apply to the design, construction, installation, testing, and maintenance of tanks and containers. The intent is to protect the public safety and welfare from the dangers of fire and/or explosion due to tank or container leakage of flammable and combustible liquids.

(2) Aboveground tanks of more than 10,000 gallons capacity for the storage of any fluid other than water shall be regulated by 527 CMR 9.00 and by 502 CMR 5.00: *Permit Requirements And Annual Inspection Of Aboveground Storage Tanks Or Containers Of More Than Ten Thousand Gallons' Capacity* for the purpose of protecting the public safety and welfare from the dangers of tank failure, rupture, or leakage. In the event of a conflict between 527 CMR 9.00 or any other requirement in 527 CMR or 502 CMR 5.00 or 780 CMR (The State Building Code), the more stringent of the aforementioned regulations shall apply.

(3) 527 CMR 9.00 shall apply to the design, construction, installation, testing and maintenance of tanks storing hazardous substances.

(4) Nothing in 527 CMR 9.00 shall be construed to abrogate the provisions of 780 CMR, The State Building Code, which may contain additional requirements for the design, construction, and installation of aboveground storage tanks.

9.02: Definitions

For the purposes of 527 CMR 9.00, the following terms shall have the meanings assigned to them:

Abandoned, in the case of underground storage tanks, shall mean out of service for a continuous period in excess of six months and for a period in excess of 24 months in the case of any aboveground tank of 10,000 gallons capacity or less; and in the case of aboveground storage of any fluid other than water, where a permit is required from the Marshal under provisions of M.G.L. c. 148, § 37, it shall mean out of service for a continuous period in excess of 60 months and it has been deemed to be unsafe and a threat to the public safety by the Head of the Fire Department and by the Department of Fire Services.

Aboveground Storage Tank. A horizontal or vertical tank, that is listed and intended for fixed installation, without back fill above or below grade, and is used within the scope of its approval or listing.

EXCEPTION 1: Aboveground Storage Tanks regulated by 527 CMR 9.04: *Vaults*, and 502 CMR 5.00: *Permit Requirements And Annual Inspection Of Aboveground Storage Tanks Or Containers Of More Than Ten Thousand Gallons' Capacity* need not meet double-walled tank requirements.

9.02: continued

EXCEPTION 2: Aboveground pressure vessels constructed in accordance with the requirements of the ASME, *Unfired Pressure Vessels Code* and regulated by M.G.L. c. 146 and 527 CMR 9.07(G) shall be exempt from the requirements for vaults or double-walled tanks.

Approved, approved by the State Fire Marshal.

Automatic Line Leak Detector, a device designed to detect product or pressure losses in a pressurized product line of a remote pumping system.

Board, the Board of Fire Prevention Regulations.

Cathodic Protection System, a technique which inhibits the corrosion of a tank or its components either through sacrificial or galvanic anodes or impressed current.

Combustible Liquid, Any liquid having a flash point at or above 100°F shall be known as a Class II or Class III Liquid. Combustible liquids shall be divided into the foll
Class II: Liquids having flash points at or above 100°F. and below 140°F.
Class IIIA: Liquids having a flash point at or above 140°F. and below 200°F.
Class IIIB: Liquids having a flash point at or above 200°F.

Components, piping, pumps, and other related storing, conveyancing, and dispensing elements which, together with one or more tanks and any cathodic protection or monitoring system, constitute a storage facility.

Consumptive Use, fuel oil used exclusively for area heating and/or the heating of domestic water on the premises where stored.

Corrosion Expert, a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. Such person shall be accredited or certified as being qualified by the National Association of Corrosion Engineers (NACE) as a Cathodic Protection Specialist or Corrosion Specialist or be a Massachusetts registered professional corrosion engineer. The corrosion expert shall follow applicable NACE criteria.

DEP, The Massachusetts Department of Environmental Protection.

Department, the Department of Fire Services.

Double-walled Tank, a container with two complete shells which provide both primary and secondary containment. The container shall have a continuous 360° interstitial space between the primary and secondary shell. The interstitial space shall be designed with an approved interstitial space monitor to continuously monitor this space. All double-walled tanks shall be UL-listed.

Engineer, a Massachusetts registered professional engineer.

European Suction System, an underground suction piping system which is sloped back to the tank so that the contents of the piping will drain back into the tank if the suction is released, and only one check valve is used which is located directly under the dispenser.

Existing Facility, a facility whose construction, installation, or operation began prior to the effective date of the revised edition of 527 CMR 9.00 printed and effective December 31, 1986.

Fire Resistant Tank. A tank assembly that consists of a listed aboveground storage tank and construction that provides fire resistive protection from exposure to a high intensity liquid pool fire. (*See* 527 CMR 9.04.)

9.02: continued

Flammable Liquid, Any liquid having a flash point below 100°F and having a vapor pressure not exceeding 40 psia at 100°F Flammable liquids shall be known as Class I liquids and shall be divided into the following classifications:

Class IA: Liquids having flash points below 73°F and having a boiling point below 100°F.
Class IB: Liquids having flash points below 73°F and having a boiling point at or above 100°F.
Class IC: Liquids having flash points at or above 73°F and below 100°F.

Fuel Oil, any hydrocarbon oil as specified by ASTM Standard D396-90, Specification for Fuel Oil.

Hazardous Substances, are regulated substances as defined in section 101(14) of the Federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 and 40 CFR Part 302. (This term does not include any substance regulated as a hazardous waste under Subtitle C of the Federal Resource Conservation and Recovery Act and 40 CFR Part 261).

Head of the Fire Department, the fire chief or other top ranking official of the local fire department, or a designee of the Head of the Fire Department.

Interim Wellhead Protection Area (IWPA) for public water systems using wells or well fields that lack a Department of Environmental Protection (Massachusetts DEP) approved Zone II, the DEP will apply an interim wellhead protection area. This IWPA shall be ½-mile radius measured from the well or well field for sources whose approved pumping rate is 100,000 gallons per day or greater. For wells or well fields that yield less than 100,000 gallons per day, the IWPA radius is proportional to the approved pumping rate which may be calculated according to the following equation: IWPA radius in feet = [32 x pumping rate in gallons per minute] + 400.

A default IWPA radius shall be applied to transient non-community (TNC) and non-transient non-community (NTNC) wells for which radii could not be calculated using the above equation because there is no metered rate of withdrawal or no approved pumping rate or to wells for which there are no DWS-determined radii using other appropriate methods. The default IWPA radius shall be 500 feet for TNC wells and 750 feet for NTNC wells.

Leakage or Leak, any uncontrolled movement of product from an above ground storage tank and/or associated piping, either observed or detected, or from an underground storage tank system when using a tightness test method, measurable by a final or precision test which can accurately detect a leak of 0.10 gallons per hour with the probability of detection of 0.95, and the probability of false alarm of 0.05; or when using a continuous monitoring system which can accurately detect a leak of 0.20 gallons per hour with the probability of detection of 0.95 and the probability of false alarm of 0.05.

Listed, equipment or materials included in a list published by an organization acceptable to the Marshal, and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that equipment or materials meet appropriate standards or have been tested and found suitable for use in a specific manner.

Marshal, the State Fire Marshal or a designee of the State Fire Marshal.

Monitoring System. A full-time system installed for the purpose of early detection of leaks, such as observation wells, visual or audible alarms, statistical inventory reconciliation (SIR) process conducted in connection with an in-tank monitoring system, or their equivalent. Minimum standards of monitoring systems shall detect a leak at a minimum rate of 0.20 gallons per hour or more with the probability of detection of 0.95, and the probability of false alarm of 0.05.

NFPA 30, National Fire Protection Association Standard 30 entitled: Flammable and Combustible Liquids Code, 2003 Edition.

9.02: continued

Nationally Recognized Testing Laboratory (NRTL). An organization which tests for safety and lists, labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00 (Appendix C).

Observation Well, a dug or drilled cased well which can be used for detecting the presence of flammable or combustible liquids, which is drilled to a depth intercepting the water table and screened as to intercept said water table, and which is installed and maintained in an approved manner.

Operator, the lessee of a storage facility, or the person or persons responsible for the daily operation of a storage facility.

Out of Service, not in use in that no filling or withdrawal is occurring.

Owner, the person or persons or government entity having legal ownership of a storage facility.

Person, any agency or political subdivision of the Federal Government or the Commonwealth of Massachusetts; any state, public or private corporation or authority, individual, trust, firm, joint stock company, partnership, association, consortium, joint venture, or other commercial entity; and any officer, employee or agent of said person, and any group of said persons.

Pipeline, any trunk pipeline within the Commonwealth for the transportation of flammable or combustible liquids.

p.s.i., pounds per square inch gauge.

Qualified Person, a representative certified by the manufacturer of the product being installed or tested.

Remote Pumping System, a pressurized product line system in which flammable and combustible liquids are supplied to a point away from the tank by means of a pumping unit.

Replacement and Substantial Modification, both mean the construction of any additions to an existing storage facility, the removing of any part of an existing storage facility (*e.g.*, a tank, or piping) and the installing of a new part, or any restoration, refurbishment, or renovation which significantly impairs or affects the physical integrity of the storage facility or its monitoring system.

Secondary Containment or Equivalent Protection, techniques that may include impervious liners, double-walled tanks, or equivalent methods approved by the Marshal.

Sole Source Aquifer, an aquifer designated by the U.S. Environmental Protection Agency as the sole or principal source of drinking water for an area as defined in 310 CMR 40.0006.

Statistical Inventory Reconciliation (SIR), a process of evaluating the various sources of errors present in daily inventory records and capable of detecting a leak or discharge from the tank system, including associated piping of 0.20 gallons per hour with the probability of detection of 0.95 and probability of false alarm of 0.05 as determined by an independent testing laboratory using the U.S. Environmental Protection Agency's standardized test procedures or equivalent.

Storage Facility, one or more tanks at a particular site, together with all components thereof, used or designed to be used for the storage of any product within the scope of 527 CMR 9.01.

Tank, any structure either underground or aboveground used or designed to be used for the storage of any product within the scope of 527 CMR 9.00; as well as any aboveground structure in excess of 10,000 gallons capacity used or designed to be used for the storage of any fluid except water.

Third-party Inspection, any inspection conducted by or under the direct supervision of a Third-party Inspector, in accordance with 527 CMR 9.07(P).

9.02: continued

Third-party Inspector, a person who has completed training required by the Marshal and who is a Massachusetts Registered Professional Engineer, a Massachusetts Licensed Site Professional, or a person holding an underground storage tank inspector certification issued by an independent organization such as: the International Code Council, National Fire Protection Association or the American Petroleum Institute, or a person holding an underground storage tank inspector certification issued by an agency of another state with underground storage tank regulations similar to 527 CMR 9.00 and approved by the Marshal, or a person who through training and experience, is otherwise acceptable to and approved by the Marshal. A third-party inspector shall not be an owner or operator of the underground storage tank, an employee of the owner/operator of the underground storage tank, or a person having daily on-site responsibility of the underground storage tank.

UL-listed, included in a current list or report of approved equipment, materials, or methods published by Underwriters Laboratories, Inc.

Underground Storage Tank System, shall mean an underground storage tank, connected underground piping, underground ancillary equipment and containment system, if any.

Underground Storage, Underground Storage Tank, UST, where 10% or more of the tank volume and piping is buried below the ground surface but which shall not include storage in a freestanding container within a building or underground storage tanks described in 527 CMR 9.07(N)(2), (3), (8), (11), (12), (13), (14), (16) and (17).

Waste Oil, used and/or reprocessed, but not subsequently re-refined, oil which has served its original intended purpose. Waste oil includes, but is not limited to, used and/or reprocessed fuel oil, engine oil, gear oil, cutting oil, and transmission fluid and dielectric fluid.

Water Supply, any raw or finished source that is presently used, reserved for future use, or under investigation for future use by a public water supply as defined in 310 CMR 22.02, or used as a source of private drinking water by one or more persons. This shall include all land and/or waters used as a tributary to a public water system except those listed under 310 CMR 22.22.

Zone A,

(a) the land area between the surface water source and the upper boundary of a bank;

(b) the land area within a 400 foot lateral distance from the upper boundary of a bank of a Class A surface water source, as defined in 314 CMR 4.05(3)(a) and;

(c) the land area within a 200 foot lateral distance from the upper boundary of the bank of a tributary or associated surface water body.

Zone B, the land area within ½-mile of the upper boundary of the bank of a Class A surface water source, as defined in 314 CMR 4.05(3)(a), or the edge of watershed, whichever is less. However, Zone B shall always include the land area within 400 foot lateral distance from the upper boundary of the bank of the Class A surface water source.

Zone I, the protective radius required around a public water well or well field. For public water system wells with approved yields of 100,000 gallons per day or greater, the protective radius is 400 feet. Tubular well fields require a 250 foot protective radius. Protective radii for all other public water system wells are determined by the following equation: Zone I radius in feet = (150 x log of pumping rate in gallons per day) - 350. This equation is equivalent to the chart in the Division's Water Supply Guidelines.

A default Zone I radius shall be applied to transient non-community (TNC) and non-transient non-community (NTNC) wells for which radii could not be calculated using the above equation because there is no metered rate of withdrawal or no approved pumping rate or to wells for which there are no DWS-determined radii using other appropriate methods. The default Zone I radius shall be 100 feet for TNC wells and 250 feet for NTNC wells.

9.02: continued

Zone II, that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at approved yield, with no recharge from precipitation). It is bounded by the groundwater divides which result from pumping the well and by the contact of the aquifer with less permeable materials such as till or bedrock. In some cases, streams or lakes may act as recharge boundaries. In all cases, Zone II shall extend upgradient to its point of intersection with prevailing hydrogeologic boundaries (a groundwater flow divide, a contact with till or bedrock, or a recharge boundary).

9.03: Aboveground Storage Tanks Greater Than 10,000 Gallons Capacity or Tanks Storing Combustible Liquids

(A) The design, construction and installation of aboveground storage tanks storing combustible liquids or aboveground storage tanks greater than 10,000 gallons gross capacity used for the storage of flammable and/or combustible liquids shall be in accordance with 502 CMR 5.00; 527 CMR 9.00 and NFPA 30 *Flammable and Combustible Liquids Code* – 2003. Tanks greater than 10,000 gallons gross capacity storing non-flammable hazardous substances shall be constructed and conform to 502 CMR 5.00 and good engineering practice. The foundation and structural supports shall be designed in accordance with 780 CMR, The State Building Code.

(B) In accordance with M.G.L. c.148, § 37, no person shall construct, maintain or use any aboveground storage tank of more than 10,000 gallons capacity, for the storage of any fluid other than water, without first securing a permit therefore from the Marshal. The aboveground storage tank shall be constructed, installed and maintained in accordance with 527 CMR 9.00 and 502 CMR 5.00.

(C) Applicability.
(1) When the general provisions of 527 CMR 9.00 differ from NFPA 30 for aboveground storage tanks greater than 10,000 gallons capacity, NFPA 30 shall apply.
Exceptions:
(a) Section 4.3.3.3.3(a) of NFPA 30-2003 does not apply.
(b) Pre-fabricated tank with a pre-fabricated dike. Where all of the following are provided: 110% containment
(c) Pre-fabricated tank with a pre-fabricated dike and rain-shield. Where all of the following are provided:
(i) 110% containment
(ii) Provisions that an overfill of the tank will go directly into the dike.
The tank shall meet the requirements of NFPA 30-2003: 4.3.2.3.3.
(2) NFPA 30 shall not apply to tanks of 10,000 gallons capacity or less storing combustible liquids, which are specifically regulated by other rules and regulations of the Board of Fire Prevention Regulations.

(D) Aboveground Piping. (Reference 527 CMR 4.00 and 527 CMR 15.00 where applicable) Piping on aboveground storage tanks shall meet the provisions of NFPA 30, Chapter 3. Where the provisions of 527 CMR 4.00 and 15.00 differ from NFPA 30 Chapter 3, 527 CMR shall apply.

(E) Location of Aboveground Tanks. The distance requirements in NFPA 30 and 527 CMR 9.00 shall not apply to replacements of existing tanks unless the Head of the Fire Department determines that their continued use shall constitute a fire hazard.

(F) Outside Fuel Oil Storage Tanks.
(1) Storage tanks larger than 660 gallons capacity used in connection with oil burning appliances (reference 527 CMR 4.00) and emergency power generators shall meet the construction provisions of Standard UL-142 and shall be located in accordance with Table 3:

9.03: continued

TABLE 3

Capacity of tank, gallons	Minimum distance in feet from property line that is or can be built upon	Minimum distance in feet from nearest side of any public way or from nearest important building on the same property
660 or less	10	0
661 to 12,000	15	5
12,001 to 30,000	20	5
30, 001 to 50,000	30	10

(2) Tanks shall be mounted on a continuous concrete slab capable of withstanding the expected load and extending eight inches beyond the perimeter of the tank or tanks. Tanks shall be securely supported by rigid non-combustible supports to prevent settling, sliding or lifting.

(3) When tanks are installed in areas subject to vehicular impact, physical barriers shall be provided. Physical barriers shall consist of lally columns, substantial pipes, bollards or similar barriers.

(4) The Head of the Fire Department may require secondary containment or dikes around storage tanks if in his opinion failure of the tank could cause irreparable harm to public health, safety and/or welfare, and/or to the environment.

(5) In areas subject to flooding or high water each tank shall be suitably anchored to withstand uplifting, including when the tank is empty.

(6) If during transportation or installation the original protective coating of the tank has been damaged, these areas shall be recovered.

(G) Transportation by Pipeline.

(1) No pipeline constructed after the effective date of 527 CMR 9.00 shall be used for the transportation of any flammable or combustible liquid unless prior to such construction the plans and specifications hereinafter required in 527 CMR 9.03(G) shall have been approved. Application for approval to construct a pipeline shall be made to the Marshal and shall be accompanied by suitable drawings, in duplicate, of the entire proposed pipeline clearly showing details of the origin and the terminals. The location of the proposed pipeline shall be shown on a map, which shall also indicate adjacent highways throughout the entire route of the proposed pipeline. Highway and river crossings must be clearly detailed on suitable drawings. The application must also be accompanied by a duplicate set of specifications showing the type of construction and the materials used. Emergency repairs may be made to an existing pipeline without complying with the provisions of 527 CMR 9.03(G).

The approval of the Marshal shall be indicated by his signature on each set of plans and specifications, one to be retained by him and one to be returned to the applicant which shall serve as a permit to transport flammable or combustible liquids, by such pipeline.

(2) Pipe valves and fittings shall be made of material suitable for use with the products conveyed and constructed of adequate strength to safely withstand the stresses to which they will be subjected in service.

Pipelines shall be designed and constructed in accordance with recognized engineering practice.

NOTE: The current code for Pressure Piping (ASA B31.1) of the American Standards Association is considered as recognized engineering practice.

(3) Pipelines shall be suitably protected against mechanical injury either by burying at least 30 inches underground, by covering with at least 30 inches of fill, or by other approved method.

(a) Pipelines in streets and highways shall, as far as practicable, be installed below all other existing pipelines or other conduits.

(b) Pipelines shall not be installed less than ten feet from any building, other than a building which is part of the pipeline system.

9.03: continued

(c) Emergency shutoff valves shall be located in pipeline at points where, because of physical or topographic conditions, valves are necessary to prevent drainage of oil from lines while being repaired.

9.04: Aboveground Storage Tanks Equal to or Less than 10,000 Gallons Capacity For Storing Class I Liquids

(A) The design, construction and installation of above ground storage tanks 10,000 gallon capacity or less storing Class I liquids shall comply with NFPA 30-2003.

(B) The storage of Class I liquids at motor fuel dispensing facilities shall comply with NFPA 30A-2003

(C) The Head of the Fire Department may further limit the quantity of flammable liquids, that may be stored aboveground, where conditions are such to warrant restricting the amount of such liquids. The Head of the Fire Department may further prescribe the manner in which flammable liquids may be stored aboveground in accordance with 527 CMR 9.04.

(D) The Head of the Fire Department may accept the installation practices of NFPA 395 at farms and other isolated locations.

9.05: Underground Storage Tanks

(A) Design and Construction of New or Replacement Underground Tanks.

(1) All new and replacement tanks must be equipped with a metallic or nonmetallic striker plate attached to the bottom of the tank at each opening. Such striker plate shall be at least 12" x 12" in area and at least ¼" thick.

(2) Underground tanks shall be designed and built in accordance with approved engineering standards for the materials of construction being used, and in accordance with 527 CMR 9.07(A).

(3) All tanks shall be designed and constructed to minimize the risk of corrosion and leakage. Fuel oil tanks of 1,100 gallons or less capacity utilized exclusively for consumptive use on the premises shall be constructed in accordance with 527 CMR 9.05(A)(4). The following construction shall be utilized for all other tanks installed after January 1, 1989. (In the period from May 1, 1988, to January 1, 1989, all underground tanks shall conform to 527 CMR 9.05(A)(4).

(a) Listed double-walled steel tanks with cathodic protection, having electrical isolation and equipped with a test box to allow measurement of electrical potential and current flow, listed double-walled fiberglass tanks, listed double-walled composite tanks having electrical isolation, a double-walled composite tank manufactured in accordance with ACT-100/89 having electrical isolation, or a listed double-walled jacketed steel tank having electrical isolation. These tanks shall be equipped with an approved standpipe, vacuum, or electronic monitoring system or an approved equivalent for the purpose of continuous monitoring the interstitial space. The material used in the construction of the UST vessel and associated piping shall be compatible with the product being stored in the UST.

(b) Any other "state-of-the-art" type of tank construction with an approved continuous interstitial space monitor and providing equal or better protection against leakage than the above-mentioned tanks and approved by the Marshal.

(4) All tanks shall be designed and constructed to minimize the risk of corrosion and leakage. The following construction shall be utilized exclusively for consumptive use on the premises:

(a) Listed double-walled fiberglass reinforced plastic (FRP) tanks, using materials compatible with the product to be stored therein. These tanks shall be equipped with a standpipe, vacuum, or electronic monitoring system, or an approved equivalent provided for the purpose of continuous monitoring the interstitial space.

9.05: continued

(b) Listed double-walled steel tanks with cathodic protection or bonded fiberglass coating, having electrical isolation, or listed double-walled fiberglass tanks. These tanks shall be equipped with a standpipe, vacuum, or electronic monitoring system, or an approved equivalent provided for the purpose of constantly monitoring the interstitial space.

(c) Any other "state-of-the-art" type of tank construction providing equal or better protection against leakage than the above-mentioned tanks and approved by the Marshal.

(5) Horizontal steel tanks located underground shall not exceed the maximum capacities, diameters, or lengths for the corresponding gauges of metal outlined in the following table and shall be equipped with cathodic protection:

TABLE 4 - UNDERGROUND HORIZONTAL TANKS

Capacity Over	Not Over	Maximum Diameter	Maximum Length	Thickness of Shell	Thickness of Heads
10 gals.	270 gals.	42"	6'	10 USS gauge	14 USS gauge
270 gals.	560 gals.	48"	11'	10 USS gauge	12 USS gauge
560 gals.	1,100 gals.	64"	14'	10 USS gauge	10 USS gauge
1,100 gals.	4,000 gals.	84"	24'	3/16"	3/16"
4,000 gals.	12,000 gals.	126"	32'	¼"	¼"
12,000 gals.	20,000 gals.	132"	42'	5/16"	5/16"
20,000 gals.	35,000 gals.	132"	50'	⅜"	⅜"

(6) Vertical steel tanks located underground shall not exceed the maximum capacities, diameters, or heights for the corresponding gauges of metal outlined in the following table and shall be equipped with cathodic protection:

TABLE 5 - UNDERGROUND VERTICAL TANKS

Capacity Over	Not Over	Maximum Diameter	Maximum Height	Unbraced Flat Tops	Thickness
10 gals.	60 gals.	24"	4'	24"	10 USS gauge
60 gals.	270 gals.	36"	6'	36"	10 USS gauge
270 gals.	560 gals.	54"	10'	43"	10 USS gauge
560 gals.	1,100 gals.	68"	12'	54"	10 USS gauge
1,100 gals.	4,000 gals.	105"	18'	72"	3/16"
4,000 gals.	12,000 gals.	132"	24'	96"	1/4"
12,000 gals.	20,000 gals.	132"	30'	120"	5/16"
20,000 gals.	25,000 gals.	132"	35'	132"	3/8"

(7) All new and replacement tank installations shall be equipped with a spill containment manhole with a minimum capacity of three gallons, capable of returning product to the tank.

(8) All new and replacement tank installations shall be equipped with an overfill prevention device. The device shall be designed so as not to preclude the ability to perform a tightness test on the tank and piping. The following options are acceptable:

(a) A device which shall automatically shut flow into the tank when the tank is no more than 95% full.

(b) A device which shall alert the individual delivering product when the tank is no more than 90% full by restricting the flow into the tank or triggering a high-level alarm.

(c) A device which shall alert the individual delivering product to the tank by restricting the flow into the tank 30 minutes prior to overfilling.

(B) Underground Piping.

(1) All new and replacement piping shall be installed with secondary containment which may include impervious liners, double-walled piping, or equivalent methods approved by the Marshal. All new or replacement piping shall be continuously monitored for product loss. If a suction system is used with a check valve under the dispensing pump and the piping is pitched to the tank, secondary containment of new or replacement piping shall not be required except as provided in 527 CMR 9.05(D)(6).

9.05: continued

(2) All new or replacement piping shall be constructed of noncorrodible materials such as fiberglass reinforced plastic (FRP) or its equivalent, or shall be protected against corrosion by the use of a steel system cathodically protected by impressed current or sacrificial anodes or by some other type of equivalent protection.

(3) Product lines shall be installed in a trench between the tank area and the pump island. Similarly, underground vent lines shall be installed in a trench.

(4) Before underground piping is installed, the trench shall receive a minimum six-inch-deep bed of well-compacted noncorrosive material such as clean washed sand or gravel. All trenches shall be wide enough to permit at least six inches of noncorrosive backfill material around all lines.

(5) All pipes connected to such tanks shall lead from the tops of tanks, and the tops of all tanks shall be below the level of the lowest horizontal pipe used in the connection therein except where the design specifically prevents a possible siphoning condition and has been approved by the Head of the Fire Department.

(6) All pipes used for the conveyance of flammable liquid shall decline to tanks without traps or pockets, and shall be protected against injury. Intermediate sumps to allow piping decline to tanks shall not be considered a trap or pocket provided the sump is monitored for leak detection. Piping drops from submerged pumps to allow piping decline to the tank shall not be considered a trap.

(7) Underground copper piping or tubing shall not be used on new or replacement piping installations unless the copper piping or tubing is adequately protected against physical damage and protected from corrosion. Copper piping or tubing shall only be allowed for use as a product line when installed in an installation covered by 527 CMR 4.00.

(8) At marine fueling facilities where tanks are at an elevation which produces a gravity head on the dispensing unit, the tank outlet shall be equipped with a device, such as a solenoid valve, positioned adjacent to, and downstream from, the outlet, so installed and adjusted that liquid cannot flow by gravity from the tank in case of piping or hose failure when the dispenser is not in use.

(9) A double elbow swing joint or flexible connector shall be installed at all locations where piping changes direction from horizontal to vertical or from vertical to horizontal.

(10) Flexible connectors constructed and listed for underground applications shall be permitted to be used without backfill in below grade tank sumps.

(11) All new or substantially modified product dispensers shall be equipped with a dispenser sump. All dispenser sumps shall be continuously monitored for product loss.

Exception: This requirement shall not apply to the replacement or repair of the product dispenser alone due to damage or malfunction, but shall apply to any replacement of both the dispenser and the equipment used to connect the dispenser to an underground storage tank.

(12) All new or replacement tanks utilizing a submersible pump shall be equipped with a sump. All sumps shall be continuously monitored for product loss.

(C) Underground Tank Installation.

(1) No new or replacement tank or piping shall be installed, whether as part of a new or existing storage facility, unless the owner has given notice of its installation to the head off the fire department; and no new or replacement tank or piping shall be buried or concealed until it has been inspected for damage and external defects, and has been approved by the Head of the Fire Department or his designee. A tightness test on all new or replacement tanks and piping shall be done after the installing, backfilling, and surfacing to grade have been completed, this test shall be of both the tank and the piping.

(2) No new or replacement tank, piping or dispenser shall be installed except by a contractor who has been certified in writing by the manufacturer or a petroleum equipment association as qualified for the purpose. The contractor shall, prior to any installation, submit to the Head of the Fire Department a copy of such certificate.

(3) The installation of a new or replacement tank, including anchoring of the tank, shall be carried out in accordance with the manufacturer's recommendation, accepted engineering practices, and the provisions of 527 CMR 9.05(C), provided that the backfill material for FRP (fiberglass reinforced plastic) tanks shall be pea gravel or crushed stone and the backfill material for all other tanks shall be either pea gravel or clean noncorrosive sand free of cinders, stones, and any other foreign material with the material under the tank to be compacted and the balance to be placed in uniform lifts and to be thoroughly compacted.

9.05: continued

(4) Any damage to the exterior of a tank or its coating shall be repaired before the tank is covered.

(5) Every new or replacement tank and its piping shall be tested separately, at the owner's expense, prior to its being buried. The tank shall be tested by air pressure not less than three lbs. and not more than five lbs. per square inch. The piping shall be tested hydrostatically (or by air pressure) to 150% of the maximum anticipated pressure of the system but not less than 50 lbs. per square inch gauge at the highest point of the system. After the tank and piping have been fully buried, all subsequent testing of the underground tanks shall be done in accordance with the provisions of NFPA 329 or other test of equivalent or superior accuracy. The owner shall furnish the Head of the Fire Department with a certified copy of all testing required by 527 CMR 9.05(F) which the fire department shall keep with the records of the storage facility.

(6) Steel tanks completely underground shall be covered with a minimum of two feet of earth or shall be covered with not less than one foot of earth, on top of which shall be placed a slab of reinforced concrete not less than four inches thick. When tanks are or are likely to be subjected to traffic, they shall be protected against damage from vehicles passing over them by at least three feet of earth cover, or 18 inches of well-tamped earth plus six inches of reinforced concrete or eight inches of asphaltic concrete. When asphaltic or reinforced concrete paving is used as part of the protection, it shall extend at least one foot horizontally beyond the outline of the tank in all directions.

(7) An underground storage tank used for the storage of a Class I flammable liquid, if within ten feet of a building having a cellar or basement shall be placed below the level of the floor of such cellar or basement.

(D) Leak Detection Equipment, Testing and/or Inventory Requirements for Underground Tanks.

(1) Consumptive use fuel oil tanks and hazardous waste tanks shall be exempt from 527 CMR 9.05(D)(2), 9.05(E)(1), and 9.05(F). Tanks used solely for emergency power generators and tanks used for a combination of consumptive use fuel oil and emergency power generators shall be exempt from 527 CMR 9.05(D)(2) and 9.05(E)(1). (Reference: 527 CMR 5.00, and 310 CMR 30.00 "Hazardous Waste Regulations"). Waste oil tanks shall be exempt from 527 CMR 9.05(D)(1) and (2); 9.05(E)(1).

(2) All other tanks shall satisfy one of the four following options:

(a) The installation and maintenance of an approved in-tank monitoring system installed and maintained by a qualified person.

1. The operator shall prepare, reconcile, and maintain daily inventory control records for each tank and for every combination of interconnected tanks. This inventory shall be taken by the use of the in-tank monitor for the purpose of prevention and early detection of leaks. (Reference: 527 CMR 9.05(E)

2. At the close of each calendar month, the operator shall use the in-tank monitor over a continuous period of six hours, during which no product is delivered to or taken from the tank, to determine any loss of product. A loss of 0.20 gallons per hour or more over a six-hour period with the probability of detection of 0.95 and a probability of false alarm of 0.05 shall constitute a leak.

3. Upon a failed result the owner/operator shall immediately notify the Head of the Fire Department. The owner/operator shall have the tank and piping tested in accordance with 527 CMR 9.05(F)(8), (9) and (12), or conduct an investigation which shall determine to the Head of the Fire Department's satisfaction that factors other than a leak caused the fail report.

4. If the procedure in 527 CMR 9.05(D)(2)(a)3. is followed and the tank is considered tight, then the requirements for tank tightness testing in 527 CMR 9.05(F) shall be considered as being complete.

(b) The installation of an approved double-walled tank, an interstitial space monitoring system, and liquid removal port.

1. This installation shall be exempt from the requirements of tank tightness testing in 527 CMR 9.05(F) provided that the continuous monitor is installed and maintained by a qualified person.

2. If the monitor activates, whether a trouble or an alarm mode, the owner/operator shall immediately notify the local fire department.

9.05: continued

(c) The installation and maintenance of an approved in-tank monitoring system installed and maintained by a qualified person with inventory data analysis conducted by an independently managed third party certified statistical inventory reconciliation (SIR) process.

1. If the SIR analysis is conclusive and identifies a statistically significant loss of any product, the result is fail. Upon a failed result the owner/operator and the SIR vendor shall immediately notify the Head of the Fire Department. The owner/operator shall have the tank and piping tested in accordance with 527 CMR 9.05(F)(8), (9) and (12), or conduct an investigation which shall determine to the Head of the Fire Department's satisfaction that factors other than a leak caused the fail report.

2. If the SIR analysis is inconclusive, the owner/operator and the SIR vendor shall immediately notify the Head of the Fire Department and conduct an investigation following the SIR vendor's loss investigation procedures. If the result is inconclusive for two consecutive months, the owner/operator shall have the tank and piping tested in accordance with 527 CMR 9.05(F)(8), (9) and (12).

3. If the result is conclusive and not a fail, the result is pass and the tank system, including associated piping, is considered tight, and the requirements for tank tightness testing in 527 CMR 9.05(F) shall be considered as being complete.

4. For the purpose of 527 CMR 9.05(D)(2)(d), the tank gauge, installed in the tank, used to generate data for SIR analysis shall have a resolution of 1/10 of an inch or better.

(d) The installation and maintenance of a Continuous In-tank Leak Detection System installed and operated in accordance with the manufacturers instructions and capable of detecting a leak or discharge of 0.20 gallons per hour with the probability of detection of 0.95 and a probability of false alarm of 0.05 as determined by an independent testing laboratory using the U.S. Environmental Protection Agency Standard Test Procedures for Evaluating Leak Detection Methods (EPA/530/UST-90/004 through 010) or other equivalent test procedures.

1. The operator shall maintain an "Equipment Check Guidelines for Inspectors" prepared by the manufacturer. This summary should guide inspectors on proper field procedures to follow when inspecting equipment for proper operation, for attempting to access the stored history (for alarms or failed tests) and to determine compliance with 527 CMR 9.05(D)(e). The guidelines shall be maintained on the site and be made readily available upon inspection.

2. If the Continuous In-Tank Leak Detection System analysis is conclusive and identifies a statistically significant loss of any product, the result is fail. Upon a failed result the owner/operator shall immediately notify the Head of the Fire Department. The owner/operator shall have the tank and piping tested in accordance with 527 CMR 9.05(F)(7), (8) and (11), or conduct an investigation which shall determine to the Head of the Fire Department's satisfaction that factors other than a leak caused the fail report.

3. If the Continuous In-Tank Leak Detection System analysis is inconclusive, the owner/operator shall immediately conduct an investigation following the system vendor's loss investigation procedures. If the system analysis is inconclusive due to high tank activity the tank(s) affected shall be taken out of service to allow the Continuous In-Tank Leak Detection System the minimum sufficient quality test time in accordance with the manufacturers recommendations. If the analysis result is then still inconclusive, the owner/operator shall have the tank and piping tested in accordance with 527 CMR 9.05(F)(7), (8) and (11), or conduct an investigation which shall determine to the Head of the Fire Department's satisfaction that factors other than a leak caused the inconclusive report.

4. If the result is conclusive and not a fail, the result is pass and the tank is considered tight, and the requirements for tank tightness testing in 527 CMR 9.05(F) shall be considered as being complete.

(3) All leak detection equipment shall be installed, calibrated, operated and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability and running condition.

9.05: continued

(4) At least once each calendar month, the operator shall take a measurement to determine if any water has entered the underground storage tank. This measurement shall be recorded and any excess of water shall be removed and disposed in the manner required by the Department of Environmental Protection (DEP). (Reference: 527 CMR 9.05(E))

(5) The operator shall maintain monthly product inventory records in accordance with 527 CMR 9.05(E)(1).

(6) Double-walled tanks with an approved interstitial space monitoring system as well as piping with secondary containment shall be required for new or replacement tanks and piping. All new or replacement piping and dispenser sumps shall be continuously monitored for product loss. All new and replacement dispensers shall be equipped with a dispenser sump.

Exception: This requirement shall not apply to the replacement or repair of the product dispenser alone due to damage or malfunction, but shall apply to any replacement of both the dispenser and the equipment used to connect the dispenser to an underground storage tank.

(7) The owner and/or operator of every storage facility shall keep all records of cathodic protection monitoring, leak detection monitoring, inventory records, calibration maintenance and repair of leak detection equipment, schedules of required calibration and maintenance provided by the leak detection equipment manufacturer and any other records required by 527 CMR 9.00 for the remaining operating life of the facility. These records shall be made readily available upon request of the Marshal and/or the Head of the Fire Department.

(E) Inventory Methods for Underground Tanks

(1) The operator of every new and existing storage facility shall prepare, reconcile and maintain daily inventory records for each tank and for each combination of interconnected tanks with a common level of product (hereinafter, a combination), for the purpose of prevention and early detection of leaks. The preparation, reconciliation, and maintenance of such records shall be done in accordance with the provisions of 527 CMR 5.06(3) as amended, with the following additions and modification:

(a) At the close of each calendar month, the operator shall determine, for that month and for each tank or combination, the number of days in which any amount of product was dispensed and the number of days in which a loss of product was recorded. These records shall include the inspection details on monitoring wells and leak detection systems.

(b) An abnormal loss of product for any tank or combination shall mean a loss not explainable by spillage, temperature variations or other causes, in excess of 0.5% of the volume of product dispensed over a period of a calendar month.

(c) In the event of any abnormal loss of product, the following steps shall be taken, with the investigation not to stop until the discrepancy has been found, the tank has been tested, repaired or replaced, or the entire procedure has been completed:

1. Inventory input and output records shall be checked by the owner of the tank for arithmetical error.
2. Inventory shall be checked by the owner of the tank for error in measurement.
3. If the abnormal loss is not reconcilable by steps 1. and 2., or cannot be affirmatively demonstrated to be the result of theft, the accessible parts of the storage system shall be checked for damage or leaks.
4. Monitoring wells and leak detection systems shall be checked for signs of a discharge.
5. Calibration of the inventory measuring system and any dispensers shall be checked.
6. The entire storage system, excluding the vent but including joints and remote fill lines, shall be tested in accordance with the applicable sections of 527 CMR 9.00.
7. If a discharge, leak, or threat of release is discovered, the requirements of the applicable sections of 527 CMR 9.07(H) shall be met by the owner of the tank.

(d) An abnormal gain of water shall be a gain in the water level inside any tank of more than one inch in a 24-hour period.

(e) In the event of any abnormal gain of water, the owner shall, at the owner's expense, have the water removed from the tank and disposed of in a manner as directed by the Massachusetts Department of Environmental Protection and shall have the tank checked for water 24 hours later, during which time no product shall be added to the tank.

9.05: continued

(f) Apart from abnormal gains of water, the owner of any tank in which water has accumulated to a depth of ½ inch or more shall at the owner's expense, have the water removed and disposed of in a manner as directed by the Massachusetts Department of Environmental Protection.

(g) For every storage facility covered by the inventory control requirements of 527 CMR 9.05(E), the operator shall maintain record on the premises or readily available for inspection by the Marshal or the Head of the Fire Department or their designee. These inventory records shall be kept on the premises or readily available for a minimum of the prior 12 months.

(Reference: Massachusetts Contingency Plan 310 CMR 40.300 *et seq*)

(2) For failure to comply with 527 CMR 9.05(E), see 527 CMR 9.05(F)(6).

(F) Testing for Tightness of Underground Storage Facilities.

(1) The owner of every new or existing storage facility shall have all new or replacement piping tested, at the owner's expense, in accordance with 527 CMR 9.05 during a period of 12-24 months after the date of installation.

(2) If any testing discloses a leak or a loss which is not reconcilable, the operator and the owner shall comply immediately with the requirements of 527 CMR 9.07(H), and the Head of the Fire Department may direct the owner, at the owner's expense, to have all other tanks on the premises and their components tested in the same manner.

(3) The owner or operator of every new or existing storage facility shall conduct mandatory inventory record keeping in accordance with 527 CMR 9.05(E) when used in conjunction with Statistical Inventory Reconciliation (SIR), by an independently managed third party certified person, and shall have the tank tested every two years. If a leak is suspected using statistical inventory reconciliation, the SIR manager shall immediately notify the owner or operator and the Head of the Fire Department.

(4) Every existing suction piping system not of European design shall either have secondary containment with an approved interstitial space monitoring system or shall be tested during the third, sixth, and ninth year after installation and at three year intervals thereafter.

(5) With respect to any tank to which the inventory control requirements of 527 CMR 9.05(E) are applicable, the Head of the Fire Department shall require the operator to have it and its piping promptly tested, at the owner's expense, whenever the operator fails to prepare, reconcile, and maintain the daily inventory records or fails to perform the required monthly calculations.

(6) The Head of the Fire Department may require the owner of any existing tank to have it and its piping tested, at the owner's expense, in any case in which the owner has failed to make timely application for a permit as required under 527 CMR 9.07(M).

(7) Except for testing performed on a tank and its piping prior to their being covered, a tank shall be tested by any final or precision test not involving air pressure which can accurately detect a leak of 0.10 gallon per hour with a probability of detection of 0.95, and a probability of false alarm of 0.05.

(8) All tests shall be approved and administered by qualified persons, and shall be performed in accordance with the most recent test protocols established by the testing equipment manufacturer. Such persons shall notify the Head of the Fire Department and provide the test protocol which will be used prior to administering a test.

(9) The owner of every existing pressurized piping system shall comply with the provisions of 527 CMR 9.05(G)(8).

(10) Every existing pressurized piping system which has secondary containment and an approved interstitial space monitor shall be exempt from tightness testing of the piping.

(11) The person performing any test under 527 CMR 9.05(F) shall promptly supply the owner and the Head of the Fire Department with certified copies of all test results for a tank and its piping. The Head of the Fire Department shall keep his copy with the records of that storage facility.

9.05: continued

(G) Upgrading of Existing Underground Storage Tank Systems.

(1) Consumptive use fuel oil tanks shall be exempt from the requirements of 527 CMR 9.05(G)(4) through (10). Tanks used solely for emergency power generators and tanks used for a combination of consumptive use fuel oil and emergency power generators shall be exempt from 527 CMR 9.05(G)(4) through (10). Waste oil tanks shall comply with the upgrade schedule in 527 CMR 9.06(C). Hazardous waste tanks shall be exempt from the requirements of 527 CMR 9.05(G)(1) through (10) and 527 CMR 9.06(C).

(2) All existing underground storage tanks shall be retrofitted with a spill containment manhole with a minimum capacity of three gallons, capable of returning product to the tank and an overfill prevention device on or before September 30, 1994 unless the storage tank is required to be upgraded with Stage II Vapor recovery in accordance with 310 CMR 7.00 before that date. On all tanks which are required to implement Stage II Vapor recovery before September 30, 1994 a spill containment manhole and an overfill prevention device shall be installed and operational on the date Stage II Vapor recovery is to be in effect in accordance with 310 CMR 7.00. Fuel oil tanks of 1,100 gallons or less capacity utilized exclusively for consumptive use on the premises shall be exempt from the retrofit of a spill containment manhole, provided the tank was installed before January 1, 1989. On a pressure filled system, any fuel oil tank that has an audible alarm and a tight connection shall be exempt from the spill containment manhole retrofit requirements. All fuel oil tanks filled by gravity shall be upgraded with a spill containment manhole and an overfill prevention device. Any underground storage tank not meeting the upgrade requirements of 527 CMR 9.05(G)(2) shall be removed from the ground or closed in accordance with 527 CMR 9.07(J)(1).

(3) An overfill prevention device shall be designed so as not to preclude the ability to perform any required tightness test on the tank and piping. The following options are acceptable:

(a) A device which shall automatically shut off flow into the tank when the tank is no more than 95% full.

(b) A device which shall alert the individual delivering product when the tank is no more than 90% full by restricting the flow into the tank or triggering a high-level alarm.

(4) All tanks shall be equipped with leak detection. The following methods are acceptable:

(a) A double-walled tank with an approved interstitial space monitor.

(b) An approved in-tank monitor which shall be utilized in accordance with 527 CMR 9.05(D)(2)(b), (d) or (e).

(c) Monitoring for vapors in the soil through the use of a continuous monitor.

(d) Monitoring for vapors in the soil through the use of a monthly monitoring device. All monthly monitoring records shall be kept for the remaining operating life of the facility and shall be made readily available upon request of the Marshal or the Head of the Fire Department or his designee.

NOTE 1: 527 CMR 9.05(G)(4)(c) or (4)(d) is used, the provisions for observation and vapor monitoring wells provided in 40 CFR parts 280 and 281 Environmental Protection Agency Underground Storage Tanks Technical Requirements - shall be deemed acceptable unless the Head of the Fire Department determines that more stringent measures are required.

NOTE 2: Not all the above-mentioned leak detection methods will be adequate to detect the presence of all products covered within the scope of 527 CMR 9.00. The owner/operator shall use a leak detection method and associated equipment which is capable of detecting the product being stored.

(5) If the tank does not have leak detection installed, the owner/operator shall have the tank removed from the ground.

(6) All pressurized piping shall meet one of the following requirements by December 22, 1990 or shall be removed from the ground.

(a) If the piping has secondary containment, an approved interstitial space monitor may be used.

9.05: continued

(b) An automatic flow restrictor, an automatic shutoff device, or a continuous alarm system shall be installed. These devices shall accurately detect a leak of three gallons per hour at ten psi in line pressure within one hour with the probability of detection of 0.95 and a probability of false alarm of 0.05. If this option is utilized, an annual test of the operation of the leak detector must be conducted in accordance with the manufacturer's requirements. In addition, if this option is utilized, one of the following must be performed and documented.

1. an annual tightness test on the piping; or
2. monthly monitoring for vapors in the soil; or
3. monthly SIR analysis conducted in accordance with 527 CMR 9.05(D)(2)(b).
4. Pressurized line leak detection systems with a leak detection capability of 0.1 GPH at 1.5 times the operating pressure with a probability of detection at 100% and a false alarm rate of 0% are exempt from the requirements of 527 CMR 9.05(G)(6)(b)1. through 3..

(7) If a European Suction System is used, leak detection is not required on the piping.

(8) If a suction system is used which is not a European Suction System, one of the following leak detection options shall be required for the piping:

(a) If the piping has secondary containment, an approved interstitial space monitor shall be used.

(b) A line tightness test shall be conducted every three years.

(9) If the facility has unprotected steel tanks and/or piping, they shall be retrofitted with cathodic protection by December 22, 1998 or the tanks and/or piping shall be removed from the ground.

(10) All single wall steel tanks shall be removed from the ground by August 7, 2017.

Exception: This requirement shall not apply to those tanks that were relined prior to August 8, 2007 in accordance with A.P.I. 1631, 1983 Edition, if the following conditions have been met:

(a) A proper permit and approval was issued by the Head of the Fire Department for such relining, and

(b) A legally valid warranty exists for said relining.

(H) Corrosion Protection.

(1) Underground storage tanks subject to corrosion shall be provided with a properly engineered and installed cathodic protection system capable of providing continuous protection to the metal components of that portion of the tank and piping that are in contact with the ground.

(2) Cathodic protection systems shall be designed by a corrosion expert. A corrosion expert shall supervise the installation and testing of any cathodic protection system. Cathodic protection systems shall be designed, installed and tested in accordance with a code of practice developed by a nationally recognized association or testing laboratory.

(3) Prior to installation or replacement and substantial modification of a cathodic protection system a permit shall be obtained from the Head of the Fire Department in accordance with 527 CMR 9.07(M). Any permit application shall be accompanied by a design plan prepared by a corrosion expert which shall include:

(a) "Native" structure to soil potential baseline data

(b) Soil/water resistivity

(c) Electrical continuity verification

(d) Stray current characteristics

(e) Interference effects

(f) A site diagram identifying structures to be protected and all cathodic protection system components, including the reference cell locations and structure contacts used to make the measurements required by 527 CMR 9.05(H)(3)(a), (c), (d) and (e).

(g) Suitable drawings shall be prepared to designate the overall layout of the tanks and piping to be protected and the location of significant items of structure hardware, corrosion control test stations, electrical bonds, electrical isolation devices, and neighboring buried or submerged metallic structures. The location of anode installations shall be recorded on drawings showing anode type, weight, spacing, depth and backfill.

9.05: continued

(4) Sacrificial or galvanic anode cathodic protection systems shall be tested to determine whether the storage system is protected against corrosion or installation and at least every three years thereafter. If test results indicate a negative voltage of at least -0.90 volts the system shall be tested at three year intervals thereafter. If test results indicate a negative voltage of between -0.85 to -0.90 the system shall be tested annually thereafter. If test results indicate a negative voltage of less than -0.85 the system shall be deemed inadequate and the owner/operator shall immediately cause an investigation to determine if the system is providing adequate cathodic protection.

(5) Impressed current cathodic protection systems shall be tested to determine whether the storage system is protected against corrosion at installation and at least annually thereafter. In addition to the annual testing, impressed current systems shall be inspected every 60 days to insure the equipment is operating as designed. Acceptable system operating voltage and amperage ranges as determined by the corrosion expert shall be affixed to each rectifier. System voltage and amperage readings shall be recorded every 60 days. If the system voltage and amperage readings are outside the range determined to be acceptable by the corrosion expert, the owner/operator shall immediately cause an investigation to determine if the system is operating as designed. Systems installed without voltage and/or amperage meters shall be retrofitted with meters upon the first annual test of the system.

(6) Cathodic protection systems shall be tested for proper operation within 60 days following the completion of any replacement and substantial modification or following excavation on the property that may have affected the cathodically protected system.

(7) Cathodic protection system design plans, applications, surveys, drawings, test data and results, must be reviewed, approved and bear the full name, signature, address, certification number and seal of a corrosion expert.

(8) If test data indicates to the corrosion expert that the system is not operating as designed the corrosion expert shall immediately notify the system owner/operator who shall notify the Head of the Fire Department. The owner/operator shall restore the system to operation as designed, or conduct an investigation which shall determine to the Head of the Fire Department's satisfaction that factors other than a system failure caused the failed test results.

(9) Records of cathodic protection system design plans, applications, surveys, drawings, test data and results, shall be maintained for the life of the cathodic protection system. All records shall be maintained on site or made readily available at the request of the Office of the State Fire Marshal and/or the Head of the Fire Department.

9.06: Waste Oil Storage Tanks

(A) Installation of Aboveground Waste Oil Storage Tanks.

(1) Permanent Storage Outside a Building.

(a) Tanks and containers that contain only crankcase drainings shall be considered as containing Class IIIB liquids. Class IIIB liquids shall be permitted to be stored in tanks and containers that meet the requirements of Sections 2.2 and 4.2 of NFPA 30, Flammable and Combustible Liquids Code-2000, as applicable.

(b) A permit shall be required to install, maintain, and store from the Head of the Fire Department in accordance with 527 CMR 14.03(1) through (5).

(c) Tanks shall be located in accordance with Table 2.3.2.1.5 of NFPA 30-2000, and shall be located at least five feet from any building openings.

(d) Tanks shall be double walled or shall have a containment dike capable of containing 110% of the capacity of all product within the dike.

(e) The tanks, based upon the building's occupancy, shall be protected against damage from vehicular traffic. The type of protection shall be steel posts, I-beams, or similar protection at the discretion of the Head of the Fire Department.

(f) For security purposes, a fence or an enclosure capable of being locked shall be erected to prevent unauthorized filling of the tank. If the tank does not have a fence or enclosure, the fill shall be capable of being locked.

(g) The tanks shall be vented and the vents shall be a minimum of 1¼ inches in diameter. Vents shall terminate not less than 12' above the adjacent ground level and shall be so located that vapors will not be trapped by eaves or other obstructions and shall be at least five feet from any building opening.

9.06: continued

(h) The tank fill shall be located on the top of the tank and be a minimum of 1½ inches in diameter.

(i) The fill shall be a funnel-type hopper fill large enough to prevent dripping and spillage when filling. The funnel-type hopper shall have a tight-fitting hinged or chained cap which shall be closed when not in use.

(j) The port used for pumping out the tank shall be located on the top of the tank. The fill and the port used for pumping out shall not be the same port.

(k) The support for waste oil tanks shall be of noncombustible material and capable of supporting the superimposed load; and the tank shall be secured against settling, sliding, or lifting.

(l) Each tank in which hazardous waste is being accumulated shall be clearly marked and labeled throughout the period of accumulation with the following:

1. The words "HAZARDOUS WASTE."
2. The hazardous waste identified in words (*e.g.*, WASTE OIL).
3. The type hazard associated with the waste indicated in words (*e.g.*, TOXIC).
4. The date on which each period of accumulation begins in that tank.

NOTE: Marks and labels shall be placed on the sides of each tank in such a manner than they are clearly visible for inspection.

(m) All tanks and associated piping shall be installed by a qualified person. This shall include certified burner technicians as well as licensed petroleum system installers.

(n) The Head of the Fire Department may allow for alternative means of compliance provided the design is satisfactory and complies with the intent of this and other applicable regulations.

(2) Permanent Storage Inside a Building.

(a) Tanks and containers that contain only crankcase drainings shall be considered as containing Class IIIB liquids. Class IIIB liquids shall be permitted to be stored in tanks and containers that meet the requirements of Sections 2.2 and 4.2 of NFPA 30, Flammable and Combustible Liquids Code-2000, as applicable. Tanks storing Class IIIB liquids inside buildings shall be permitted to be located at, below, or above grade.

(b) A permit shall be required to install, maintain, and store from the Head of the Fire Department in accordance with 527 CMR 14.03(1) through (5).

(c) Shall be located at least five feet from exits. Overhead garage doors shall not be considered exits.

(d) Shall have a drip pan or accidental spill containment at the discretion of the Head of the Fire Department. The drip pan or spill containment is for minor spills and shall not be considered a dike. No containment diking is required.

(e) The tank, based upon the occupancy of the building, shall be protected against damage from vehicular traffic. The type of protection shall be steel posts, I-beams, or similar protection at the discretion of the Head of the Fire Department.

(f) The tank shall be vented to the outside of the building.

(g) Vents shall be a minimum of 1¼ inches in diameter. Vents shall terminate not less than 12' above the adjacent ground level and shall be so located that vapors will not be trapped by eaves or other obstructions and shall be at least five feet from any building opening.

(h) The tank fill shall be located on the top of the tank and be a minimum of 1½ inches in diameter.

(i) The tank fill shall be a funnel-type hopper fill large enough to prevent dripping and spillage when filling. The funnel-type hopper shall have a tight-fitting hinged or chained cap which shall be closed when not in use.

(j) The port used for pumping out the tank shall be located on the top of the tank. The fill and the port used for pumping out shall not be the same port.

(k) The support for waste oil tanks shall be of noncombustible material and capable of supporting the superimposed load; and the tank shall be secured against settling, sliding or lifting.

(l) Each tank in which hazardous waste is being accumulated shall be clearly marked and labeled throughout the period of accumulation with the following:

1. The words "HAZARDOUS WASTE"
2. The hazardous waste identified in words (*e.g.*, WASTE OIL)
3. The type hazard associated with the waste indicated in words (*e.g.* TOXIC)

9.06: continued

4. The date on which each period of accumulation begins, marked on each tank at the time the accumulation begins in the tank.

NOTE: Marks and labels shall be placed on the sides of each tank in such a manner that they are clearly visible for inspection.

(m) Underlying all aboveground tanks in which hazardous waste is accumulated shall be a surface that is designed and at all times operated so that it is free of cracks and gaps and is sufficiently impervious to contain leaks and spills until the collection material is detected and removed. All aboveground hazardous waste tanks shall be placed so that the entire surface beneath each such tank can be inspected for spills and structural integrity.

(n) All tanks and associated piping shall be installed by a qualified person. This shall include certified burner technicians as well as licensed petroleum system installers.

(o) The Head of the Fire Department may allow for alternative means of compliance provided the design is satisfactory and complies with the intent of this and other applicable regulations.

(3) Removable Storage Inside a Building.

(a) Tanks and containers that contain only crankcase drainings shall be considered as containing Class IIIB liquids. Class IIIB liquids shall be permitted to be stored in tanks and containers that meet the requirements of Sections 2.2 and 4.2 of NFPA 30, Flammable and Combustible Liquids Code-2000, as applicable. Tanks and containers storing Class IIIB liquids inside buildings shall be permitted to be located at, below, or above grade.

(b) A permit shall be required to install, maintain, and store from the Head of the Fire Department in accordance with 527 CMR 14.03 sections 1 through 5.

(c) Shall be located as far as possible from exits. Overhead garage doors shall not be considered exits.

(d) Shall have a drip pan or accidental spill containment at the discretion of the Head of the Fire Department. The drip pan or spill containment shall not be considered a dike. No containment diking is required.

(e) The container(s), based upon the occupancy of the building, shall be protected against damage from vehicular traffic. The type protection shall be steel posts, I-beams, or similar protection at the discretion of the Head of the Fire Department.

(f) A funnel-type hopper fill large enough to prevent dripping and spillage when filling shall be on site and used during filling procedures.

(g) At the discretion of the Head of the Fire Department, emergency relief venting shall be installed on all containers.

(h) When not in use, the container(s) shall be capped vapor tight.

(i) Each tank in which hazardous waste is being accumulated shall be clearly marked and labeled throughout the period of accumulation with the following:

1. The words "HAZARDOUS WASTE"
2. The hazardous waste identified in words (*e.g.*, WASTE OIL)
3. The type hazard associated with the waste indicated in words (*e.g.*, TOXIC)
4. The date on which each period of accumulation begins marked on each tank.

NOTE: Marks and labels shall be placed on the sides of each tank in such a manner that they are clearly visible for inspection.

(j) Underlying all aboveground tanks in which hazardous waste is accumulated shall be a surface that is designed and at all times operated so that it is free of cracks and gaps and is sufficiently impervious to contain leaks and spills until the collection material is detected and removed. All aboveground hazardous waste tanks shall be placed so that the entire surface beneath each such tank can be inspected for spills and structural integrity.

(k) The location of the removable container(s) shall be specified by the Head of the Fire Department.

(l) The Head of the Fire Department may allow for alternative means of compliance provided the design is satisfactory and complies with the intent of this and other applicable regulations.

9.06: continued

(B) Automotive Lubrication Service Centers.

(1) The following applies to the storage of flammable or combustible liquids within an automotive lubrication service center when the storage is to be in tanks and containers installed aboveground. Tanks and containers that contain only crankcase drainings shall be considered as containing Class IIIB liquids. Class IIIB liquids shall be permitted to be stored and dispensed from tanks and containers that meet the requirements of Sections 2.2 and 4.2 of NFPA 30, Flammable and Combustible Liquids Code-2000, as applicable.

(a) A permit shall be required to install, maintain, and store from the Head of the Fire Department in accordance with 527 CMR 14.03(1) through (5).

(b) The tanks shall be located in a separate room (known as the storage room) from the main work area by a two-hour fire-rated concrete block wall or other acceptable separation.

(c) The storage room shall be equipped with a fixed fire suppression system designed and installed in accordance with NFPA 17.

(d) The entrance to the storage room shall have a threshold a minimum of 12" high with a two-hour fire-rated door closed when not in use.

(e) The storage room shall be large enough to act as a containment dike capable of containing 110% of the largest tank capacity plus 10% of the aggregate amount of all other tanks.

(f) All tanks shall be vented to the out side of the building. Waste oil tank vents shall be a minimum of 1¼ inches in diameter and shall terminate not less than 12' above the adjacent ground level and shall be so located that vapors will not be trapped by eaves or other obstructions and shall be at least five feet from any building opening.

(g) The support for the tank(s) shall be of noncombustible material and capable of supporting the superimposed load; and the tank shall be secured against settling, sliding, or lifting.

(h) All tanks and associated piping shall be installed by a qualified person.

(i) Each tank in which hazardous waste is being accumulated shall be clearly marked and labeled throughout the period of accumulation with the following:

1. The words "HAZARDOUS WASTE"
2. The hazardous waste identified in words (*e.g.*, WASTE OIL)
3. The type hazard associated with the waste indicated in words (*e.g.* TOXIC)
4. The date on which each period of accumulation begins, marked on each tank at the time accumulation begins in that tank.

NOTE: Marks and labels shall be placed on the sides of each tank in such a manner that they are clearly visible for inspection.

(j) Underlying all aboveground tanks in which hazardous waste is accumulated shall be a surface that is designed and at all times operated so that it is free of cracks and gaps and is sufficiently impervious contain leaks and spills until the collection material is detected and removed. All aboveground hazardous waste tanks shall be placed so that the entire surface beneath each such tank can be inspected for spills and structural integrity.

(k) The waste oil tank(s) shall be equipped with a valve which will close when the tank has been filled to within 95% of its capacity to prevent further filling of the tank or shall be equipped with an audible high level alarm which shall sound when the tanks(s) has been filled to within 95% of its capacity.

(l) The basement shall be constructed entirely of noncombustible materials, including storage racks and platforms.

(m) The basement shall be provided with a mechanical ventilation system capable of providing a minimum of six air changes per hour with duct openings located not less than six inches nor more than 12 inches above the floor.

(n) The basement area shall have proper means of egress in accordance with 780 CMR: *the Massachusetts State Building Code.*

(o) The oil and lube oil pumps and product delivery lines shall not be left under pressure when the lubrication center is not open for business unless a protective device is installed that will prevent continuous pumping of product in the event of a line or pipe rupture.

(p) The Head of the Fire Department may allow for alternative means of compliance provided the design is satisfactory and complies with the intent of this and other applicable regulations.

9.06: continued

(C) Upgrade of Existing Underground Waste Oil Storage Tank Systems.

(1) All existing underground waste oil storage systems shall be equipped with leak detection. Unprotected steel tanks shall be equipped with cathodic protection or be removed from the ground on or before December 22, 1998.

(2) Existing underground waste oil storage tanks shall have weekly tank gauging conducted according to the following:

(a) Tank liquid level measurements are taken at the beginning and ending of a period of at least 24 hours during which no liquid is added to or removed from the tank.

(b) Tank liquid level measurements are based on an average of three consecutive stick readings at both the beginning and ending of that period. The stick used for measuring the level of the waste oil shall be divided in ⅛ of an inch increments

(c) Tank liquid level measurements shall not be required if a double-walled tank with continuous monitoring is utilized.

(d) A leak is suspected and subject to the requirements 527 CMR 9.07(M) and 310 CMR 40.0300 if the variation between beginning and ending measurements exceeds the weekly standards derived from averaging four consecutive weekly tests. The standards are in the following table:

NOMINAL TANK CAPACITY	WEEKLY STD. (One Test)	MONTHLY STD. (Avg. of 4 Tests)
550 gallons or less	10 gallons	5 gallons
551 - 1000 gallons	13 gallons	7 gallons
1001 - 2000 gallons	25 gallons	13 gallons

(e) The beginning and ending measurements, variation and average figures shall be recorded and maintained in a log book until the tank is removed from the ground.

Note: The averaging shall be done as follows: Average weeks 1 through 4, average weeks 5 through 8 *etc.*)

(f) Waste oil tanks connected to oil burning equipment shall be exempt from 527 CMR 9.06(C)(2)(a) through (e) during periods when oil burning equipment is in use.

(3) All existing tanks shall be equipped with one of the leak detection methods specified in 527 CMR 9.05(G)(4) except that 527 CMR 9.05(G)(4)(d) shall not be utilized for a waste oil tank. Leak detection shall be retrofitted in accordance with the schedule outlined in 527 CMR 9.05(G).

(4) A removable funnel at least 12 inches in diameter shall be used to prevent a spillage when filling the waste oil tank. This funnel shall be in use on or before December 30, 1990. The tank shall have a tight fitting cap which shall be closed when not in use.

(5) Owners or operators shall ensure that releases due to overfilling do not occur. The owner and/or operator shall ensure that the volume available in the tank is greater than the volume of waste oil to be transferred to the tank before the transfer is made and that the operation is monitored constantly to prevent over spilling.

9.07: General Provisions

(A) Material and Construction of Tanks and Containers: (Reserved)

(B) Fill and Vent Pipes for All Tanks and Containers. (Reference: 527 CMR 4.00 where applicable)

(1) Each storage tank shall be provided with a filler pipe and a vent pipe, and may have a gauge pipe. If gauge pipe terminates within a building, the opening to same shall be protected.

(2) Filler pipes of tanks shall be not less than 1¼ inches in diameter, and shall extend down to within four inches of the bottom of the tanks.

(a) All fill covers, including at least six inches onto the adjoining fixed metal, cement or pavement surface shall be painted in accordance with the following color codes:

Unleaded - White
Premium Unleaded - Red
Kerosene - Brown
Unleaded Plus - Blue
Diesel - Yellow
Fuel Oil - Green

9.07: continued

(b) The tank owner shall insure that all tanks and appurtenances including adapters, gaskets and caps are secure, operable and without excessive wear.

(3) The receiving end of the filler pipe of a storage tank shall be designed to provide for a tight connection between a discharge hose and inlet. A filler pipe shall be located outside the building and shall be provided with a nonferrous plug or cap capable of preventing vapors from escaping or water from entering.

(4) Where a filler pipe runs to a sidewalk, alley, private way, or public highway, it shall terminate in a metal box with a metal cover set flush with the surface of the sidewalk at the curb, alley, private way, or highway; and it shall be provided with a nonferrous plug cap.

(5) Vent pipes of tanks shall be not less than 1¼ inches in diameter, shall be carried up to a point not less than 12 feet above the ground level at the filling point of the tank, shall terminate not less than five feet from any door or window opening, and shall be fitted with an approved weather hood screen with noncorrosive wire not coarser than 30-mesh. (Reference: 527 CMR 9.07(B)(6)).

(6) The provisions of 527 CMR 9.07(B)(5), 9.05(B)(2), and 9.03(D)(1) not withstanding, the vent pipes of underground storage tanks may be manifolded for the purpose of effecting a vapor recovery system provided that the pipe size shall be such as to discharge, within the maximum pressure limitations of the system, the vapors they may be required to handle when manifolded tanks are filled simultaneously. The use of pressure vacuum valves on vent pipes shall be permitted provided the vapor collection and control system is certified by the Department of Environmental Protection, is listed, allows the underground storage tank system to vent to the atmosphere in the event of emergency conditions and is maintained in accordance with the manufacturer's instructions. The person supplying the vapor recovery system shall specify the minimum vent pipe size to conform to these requirements, and such specifications shall be followed by the installer.

(7) All tanks shall have one or more vents large enough to relieve any undue pressure to which they may be subjected. The vent pipe shall be arranged to discharge to the open air and to pitch toward the storage tank.

(C) Product Transfer. The owner and/or operator shall ensure that the volume available in the tank is greater than the volume of product to be transferred to the tank before the transfer is made and that the transfer operation is monitored constantly to prevent overfilling and spilling. It is the responsibility of the owner and/or operator to make available to the person delivering product the proper tank chart.

(D) Piping for All Tanks. (Reference: 527 CMR 4.00 where applicable) All piping, fittings and valves shall be constructed of materials that are compatible with the product to be stored in the tank to which the piping is connected.

(E) Pumping System.

(1) No flammable or combustible liquid shall be delivered to any storage facility tank by means of a pump under pressure unless such storage tank is designed to withstand the additional stress to which it may be subjected to or unless the vent pipe for such tank is of sufficient size to relieve the tank of any undue pressure.

(2) No suction pumping system shall be equipped with more than one check valve, and shall be so installed that it may be tested or replaced without disturbing other elements of the storage facility. In no case shall there be a return waste pipe from the pump to the tank, which has any opening to the atmosphere. When a pump is located within a building, it shall be in a well-ventilated portion thereof.

(3) Remote pumping systems shall be designed or equipped so that no part of the system will be subjected to pressures above its allowable working pressure.

(4) All remote pumping systems shall be equipped with an automatic line leak detector.

(5) On a remote pumping system, a listed rigidly-anchored emergency shutoff valve incorporating a fusible link or other thermally actuated device designed to close automatically in event of severe impact or fire exposure shall be properly installed in the supply line at the base of each individual island-type dispenser. The automatic closing feature of this valve shall be tested by a qualified person at the time of initial installation and at least once a year thereafter by manually tripping the hold-open linkage.

9.07: continued

(6) The operator shall immediately advise the owner should a leak detector signal a suspected product loss or a suction product system indicate a potential symptom of a leak (*i.e.*, meter display jumping or skipping, liquid not being pumped when pump is on, initial pump overspeed followed by slow pumping, erratic liquid flow indicating air and liquid mixture, continued loss of prime in the pumping unit, *etc.*).
(7) The owner and/or operator shall take immediate action to verify the operation of the pumping system when a leak is suspected. Should a loss be determined, the owner and/or operator shall take immediate corrective action. The affected pumping system shall be taken out of service until the necessary corrective action has been taken.
(8) All new and replacement remote pumping system dispensers shall be equipped with a dispenser sump. The sump shall be monitored for product loss.

Exception: This requirement shall not apply to the replacement or repair of the product dispenser alone due to damage or malfunction, but shall apply to any replacement of both the dispenser and the equipment used to connect the dispenser to an underground storage tank.

(F) Non-flammable Hazardous Substances
(1) Hazardous substances with a flash point are considered flammable liquids and shall follow all the provisions of 527 CMR 9.00.
(2) All new or replacement non-flammable hazardous substance underground storage tanks and piping shall comply with all provisions of 527 CMR 9.00.
(3) All existing non-flammable hazardous substances underground storage tank systems shall be upgraded in accordance with the provisions of 527 CMR 9.05(G).

(G) Pressure Vessels. The construction of any tank subject to pressure shall meet the design standards of NFPA 30, sections 2.2.3.2 and 2.2.3.3, provided section 2.2.3.3.2 shall not apply.

(H) Response to Leaks.
(1) In the event of a leak, whether determined by testing or otherwise, the following steps shall be taken:
(a) The operator shall immediately notify the owner
(b) The owner or operator shall immediately notify the head of the fire department and the DEP.
(c) If testing has confirmed that the source of the leak is the piping for a particular tank, the operator shall take that tank out of service immediately.
(d) If testing has confirmed that the source of the leak is a particular tank, the owner shall within 24 hours cause that tank to be emptied of all its product.
(2) The Head of the Fire Department shall verify that the requirements of 527 CMR 9.07(H)(1) are complied with.
(3) Upon the arrival of the representative of DEP, the Head of the Fire Department shall advise him of the conditions at the site and the results of the investigations required by 527 CMR 9.07(H)(1).
(4) The owner and the operator shall cooperate with the representative of DEP in all efforts to locate the source of the leak, to contain it, *etc.*
(5) The Head of the Fire Department shall remain in command during the containment procedures as long as, in his opinion, a fire or explosion hazard exists. During this period, the elimination of the fire/explosion hazard will have priority over all other concerns, while recognizing that the protection of the environment should be considered at all times. Once such hazards cease, the representative of DEP shall direct the owner/operator regarding the required response action necessary to mitigate the release to the environment. (*Reference*: Massachusetts Contingency Plan 310 CMR 40.300 *et seq.*)

(I) Tank Repair.
(1) No underground tank shall be relined.
(2) The Head of the Fire Department shall determine whether any other tank shall be removed and replaced or whether it may be repaired, and he shall notify the owner of his decision.
(3) Any repair of a tank or replacement or repair of its components shall be by an approved tank company, performed by qualified technicians, following the manufacturer's directions, and recommendations of American Petroleum Institute in effect as of the date of such repair

9.07: continued

(4) If the Head of the Fire Department determines that a tank and its components shall be removed, the owner shall first obtain a permit from him pursuant to M.G.L. c. 148, § 38A. Any removal shall be completed within 90 days after the Head of the Fire Department has notified the owner of his decision.

(5) The owner and/or operator shall maintain records of each repair or relining for the remaining operating life of the underground storage tank system.

(J) Tanks Abandoned or Temporarily Out of Service.

(1) If the owner decides to abandon a tank which is either located under a building and cannot be removed from the ground without first removing the building or which is so located that it cannot be removed from the ground without endangering the structural integrity of another tank, the owner shall notify the Head of the Fire Department of this condition. After verification by a registered professional engineer that such a condition so exists, the owner shall have all product removed from the tank, by hand pump if necessary, under the direction of the Head of the Fire Department, and shall have the tank filled with a concrete slurry mix or any other inert material approved by the Marshal for this purpose. Before permanent closure in place of an underground tank and/or underground piping is completed, the owner/operator, at his or her own expense shall measure for the presence of a release of oil or hazardous material, where contamination is most likely to be present on the site. If contamination is found, the owner/operator shall immediately notify the Head of the Fire Department and DEP.

(2) Except as provided in 527 CMR 9.07(J)(1), no tank may be abandoned in place. Any owner of a tank who has decided to abandon it and any owner of a tank which has been out of service for a period of time constituting abandonment as defined in 527 CMR 9.02, shall immediately obtain a permit from the Head of the Fire Department pursuant to M.G.L. c. 148, § 38A, and, subject to the directions of the Head of the Fire Department, shall have any product removed from the tank, all openings properly secured, and the tank removed from the ground. The product and tank shall be disposed of in accordance with 310 CMR 30.00, at the owner's expense, as directed by the Head of the Fire Department.

(3) The owner of every underground storage tank licensed under M.G.L. c. 148, which the owner has decided to take out of service for a period of less than six months, shall promptly notify the Head of the Fire Department of the decision, shall have all product removed from the tank and disposed of in accordance with 310 CMR 30.00: *Hazardous Waste*, as directed by the Head of the Fire Department, and shall have all openings properly secured and the tank rendered inert. During any period a tank is temporarily out of service the owner must continue operation and maintenance of corrosion protection in accordance with 527 CMR 9.05(E)(2). Before any such tank may be restored to service, the owner of the tank shall notify the Head of the Fire Department, who may require that the owner have the tank and its piping tested, at the owner's expense, in accordance with the provisions of 527 CMR 9.05(F).

EXCEPTION: Double walled tanks may be taken out of service for a period not to exceed 24 months provided the provisions of 527 CMR 9.07(J)(3) are met.

(4) The owner of every aboveground tank of more than 10,000 gallons capacity for the storage of any fluid other than water, required to have a permit from the Marshal under the provisions of M.G.L. c. 148, § 37 which has been out of service for more than 12 consecutive months shall promptly notify the Head of the Fire Department and shall have all product removed from the tank and the tank cleaned properly.

(5) The owner of every aboveground tank referred to in 527 CMR 9.07(J)(4) which has been out of service for more than 24 consecutive months and who intends to restore the tank to service must first notify the Head of the Fire Department and must have, at the owners expense, an examination of the tank conducted by a qualified registered professional engineer not permanently employed by the owner or operator of the tank. The examination of the tank will include a visual inspection of the tank welds, walls, foundation and an ultrasonic test of the floor plate thickness. A copy of the engineers report must be filed with the Head of the Fire Department. The tank must also be inspected by the State Fire Marshal before the tank can be restored to service.

9.07: continued

(6) The owner of every aboveground tank, referred to in 527 CMR 9.07(J)(4), who intends to restore to service any such tank that has been out of service for more than 60 consecutive months must first notify the Head of the Fire Department and must have at the owner's expense a physical inspection and hydrostatic test of the tank conducted by a qualified registered professional engineer not permanently employed by the owner or operator of the tank. The physical examination shall include the same requirements as 527 CMR 9.07(J)(5). The person conducting such tests and examinations shall notify the Head of the Fire Department prior to the tests and examinations. This person shall promptly supply the tank owner (or operator) and the Head of the Fire Department with certified copies of all tank tests and examinations. Prior to the tank being restored to service it must also be examined by the Marshal.

(7) If an aboveground tank subject to the requirements of 527 CMR 9.07(J)(7) which has been used for the keeping or storage of gasoline of other petroleum products, has been abandoned, in accordance with the requirements of 527 CMR 9.00, the Head of the Fire Department shall order the owner or operator of the tank to dismantle and dispose of the tank except where the Fire Marshal determines that the integrity of said tank complies with the construction intent of 527 CMR 9.00, and the Head of the Fire Department concurs.

(K) Tank Removal.

(1) Any person granted a permit by the Marshal or the Head of the Fire Department to remove a tank under the provisions of M.G.L. c. 148, or 527 CMR 9.00, shall within 72 hours provide the permit-granting authority with a receipt for delivery of said tank to the site designated on the permit.

(2) Before any person is granted a permit by the Marshal or the Head of the Fire Department to remove a tank under the provisions of M.G.L. c. 148, or 527 CMR 9.00, and said tank is not being transported to an approved tank yard, the person requesting the permit shall provide the permit-granting authority with written approval for the designated site of disposition. (Reference: 502 CMR 3.00 for tank removal and disposal procedure)

(3) Underground piping shall not be abandoned in place unless the Head of the Fire Department believes that the removal would constitute a danger to public safety. If the Head of the Fire Department believes that removal of the underground piping constitutes a danger to public safety the piping shall be cleaned and rendered safe as specified by the Head of the Fire Department.

(4) Within 24 hours after the removal of underground tanks and/or underground piping the owner/operator shall measure for the presence of a release of oil or hazardous materials to the environment where contamination is most likely to be present on the site. If contamination is found the owner/operator shall immediately notify the Head of the Fire Department as well as the DEP.

(L) Enforcement and Appeals.

(1) Any owner or operator who violates any provision of 527 CMR 9.00 shall be subject to the penalties provided under M.G.L. c. 148, § 38H, as amended. Each day during which such violation continues shall constitute a separate offense. Upon request of the Head of the Fire Department, the licensing authority and the town/city counsel shall take any legal action necessary to enforce the provisions of 527 CMR 9.00.

(2) In the event of a violation of 527 CMR 9.00 by the owner or operator of a storage facility, the Head of the Fire Department or the Marshal, instead of or in addition to requesting enforcement under 527 CMR 9.07(L)(1), may revoke or suspend the owner's permit or may require more frequent testing than would otherwise be required under 527 CMR 9.05(F); and if a permit is revoked or if a storage facility has been installed or maintained without a permit, the Head of the Fire Department or the Marshal may order that the storage facility be removed from the ground. Before revoking or suspending an owner's license or requiring removal of the storage facility from the ground, the licensing authority shall hold a public hearing on the proposed action, and shall by certified mail give the owner at least ten days' advance notice of the hearing, and shall render its decision in writing with a brief statement of the reasons therefor.

9.07: continued

(3) After a public hearing, the Head of the Fire Department may, with the concurrence of the Marshal, vary the application of any provision of 527 CMR 9.00 unless otherwise required by law when in his opinion the applicant has demonstrated that an equivalent degree of protection will still be provided to public and private water supplies. Notice of the public hearing shall be given at least ten days prior thereto, by certified mail at the applicant's expense to all abutters to the applicant's property, and by publication in a newspaper or general publication in a town or city. The notice shall include a statement of the variance sought and the reasons therefor. Any grant or denial shall be in writing and shall contain a brief statement of the reasons for the grant or denial.

(4) All tanks used for the storage of flammable and combustible liquids shall be subject to 527 CMR.

(5) All tanks and their appurtenances shall be maintained in a safe condition at all times.

(6) No tank for which a permit has been issued for the storage of any liquid with a specific gravity of one or less shall be used for the storage of any liquid with a specific gravity of more than one.

(7) No wooden tank shall be used for the storage of any flammable or combustible liquid.

(8) No open tank shall be used for the storage of any flammable or combustible liquid.

(M) Permits.

(1) Permits issued under 527 CMR 9.07(M) shall be issued and renewed contingent upon passing the inspection conducted pursuant to 527 CMR 9.07(P). Either the original or photographic copy of all current permits granted under the provisions of 527 CMR 9.00 shall be conspicuously posted or kept on the premises.

(2) New Tank or Storage Facilities:

(a) No tank storage facility shall be installed unless the owner shall first have obtained a permit from the Head of the Fire Department. This permit shall be in addition to any license or any other permit required by M.G.L. c. 148, or by any regulations issued thereunder.

(b) The application for a permit shall be on a form prescribed by the Marshal and obtained from the Head of the Fire Department and shall include, but not limited to the following information:

1. Name, address, and telephone numbers (day and night) of the owner.
2. Name, address, and telephone numbers (day and night) of the operator.
3. The number of tanks in the proposed facility and the capacity of each proposed tank.
4. The proposed type of construction of each tank and its piping, together with the tank's approval number if any, and a description of any provisions made for cathodic protection, electrical isolation, and early detection of leaks through a monitoring system.
5. The depth below ground level of the lowest and highest points of each proposed tank.

EXCEPTION: Aboveground Storage tanks regulated under 527 CMR 9.04, shall be exempt from providing information on any provisions made for 527 CMR 9.07(M)(2)(b)5. the depth below ground level of the lowest and highest points of each proposed tank.

(c) In a storage facility with more than one proposed tank, the applicant shall furnish the Head of the Fire Department with a certificate signed by a qualified person stating that the proposed facility meets all the design requirements of 527 CMR 9.00.

(d) The applicant shall also furnish a plot plan of the site and the area surrounding it, showing the location of each proposed tank and its components and of any building on the site, and the approximate location of any public or private well and of any body of surface water within 500 feet of the proposed storage facility.

(e) The Head of the Fire Department may require secondary containment or equivalent protection for new installations where groundwater below the facility is within Zone II (Zone of Contribution) of municipal water wells, or where private potable water wells or a water supply reservoir is within 300 feet of the tank installation.

9.07: continued

(3) Existing Storage Facilities:

(a) The owner of every underground storage facility installed prior to May 9, 1986, shall apply to the Head of the Fire Department for a permit to maintain the storage facility. Application shall be made on forms obtained from the Head of the Fire Department.

(b) The applicant shall furnish a plot plan to scale of the facility site and the area surrounding it, showing the location of each tank and its components and of any building on the site, and the approximate location of any public or private well and of any body of surface water within 500 feet of the storage facility. Legend notes shall include, to the extent available to the owner, the following information and any other information required by the Head of the Fire Department.

1. Name, address, and telephone numbers (day and night) of the owner.
2. Name, address, and telephone numbers (day and night) of the operator.
3. The number of tanks in the facility and the capacity and contents of each tank.
4. The type of construction for each tank and its piping, together with a description of any provisions made for cathodic protection, electrical isolation, and early detection of leaks through a monitoring system.
5. The date of installation of each tank.

(c) The owner shall furnish evidence of the date of installation. Such evidence may include, but is not limited to, a copy of any license or permit issued by the local licensing authority and the Head of the Fire Department. If no substantial evidence of the date of installation is supplied, the tank shall be presumed to have been installed 20 years prior to May 8, 1986.

(d) The following storage facilities shall be exempt:

(i) Farm or residential tanks of 1100 gallons capacity or less used for storing motor fuel for noncommercial purposes.

(ii) Residential or commercial tanks storing or having stored heating oil (fuel oil) for consumptive use on the premises.

(e) The filing deadline for a permit to maintain an existing storage facility is May 8, 1986.

(4) Replacement or Substantial Modification:

(a) There shall be no replacement of a tank or its components or substantial modification thereto, unless the owner has first applied for and obtained a permit from the Head of the Fire Department, who shall keep a copy of the permit with the records for that storage facility.

(b) Any application for approval under 527 CMR 9.07(K)(4) shall be in writing and shall clearly describe the type of construction of any replacement tank or component of the modification that is proposed.

(c) If the Head of the Fire Department determines that the proposed replacement or modification constitutes a danger to a public or private well, aquifer, recharge area or body of surface water, or for any other reason, the Head of the Fire Department may deny the application or approve it subject to conditions that he may deem necessary to protect such public or private water supply.

(d) No replacement or substantial modification shall be made except by a contractor who has been certified by the manufacturer as qualified for that purpose.

(e) The Head of the Fire Department may require that existing tanks other than those used for heating purposes shall be equipped with observation wells or other detection systems if in his opinion the location of the tanks could jeopardize safety of the public.

(5) Renewal of Permits and Changes of Ownership:

(a) The owner of any new or existing facility for which a permit has been issued under 527 CMR 9.07(M) must apply to the Head of the Fire Department for renewal of the permit upon expiration. The application for renewal must include any changes required under 527 CMR 9.07(M). No application for renewal may be denied except for violations of 527 CMR 9.00 and in accordance with the procedural requirements of 527 CMR 9.07(L)(2).

(b) The owner of any storage facility shall within seven working days notify the Head of the Fire Department of any change in the name, address, or telephone numbers of the owner or of the operator. In the case of any transfer of ownership, the new owner shall be responsible for the notification of this transfer.

9.07: continued

(c) The owner of any storage facility shall within seven working days notify the Marshal of any tank replacement, repair, modification, or upgrading, and of any change in the name, address, or telephone numbers of the owner or the operator. In the case of any transfer of ownership, the new owner shall be responsible for the notification of this transfer.

(N) Financial Responsibility Requirements. In accordance with the provisions of Federal regulations 40 CFR parts 280 and 281 owners and operators of petroleum underground storage tanks shall demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental release arising from the operation of petroleum underground storage tanks. The amount of financial coverage and the dates for coverage implementation are specified in 40 CFR parts 280 and 281. The following tanks are exempt from the financial responsibility requirements;

(1) UST's containing hazardous wastes already regulated under the Federal Resource Conservation and Recovery Act.
(2) UST systems containing electrical equipment and hydraulic lifts.
(3) Wastewater treatment UST's that are regulated by the Clean Water Act.
(4) UST's with a capacity of less than 110 gallons, and tanks holding a minimal concentration of regulated substances.
(5) UST's that serve as emergency backup, hold regulated substances for only a short time, and are expeditiously emptied after use.
(6) Field constructed tanks.
(7) UST's containing radioactive materials and UST's used as backup diesel tanks at nuclear facilities.
(8) Airport hydrant fueling systems.
(9) Farm or residential tanks with a capacity of 1,100 gallons or less storing motor fuel which is not for resale.
(10) Tanks for storing heating oil which is consumed on site.
(11) Septic tanks.
(12) Certain pipeline systems, such as those regulated under the Natural gas Pipeline Safety Act of 1968.
(13) Surface impoundment's, pits, ponds or lagoons.
(14) Storm or waste water collection systems.
(15) Flow-through process tanks.
(16) Liquid trap and other lines used in oil or gas production.
(17) Storage tanks on or above the floor of an underground area, such as a basement or tunnel.

(O) Delivery Prohibition Orders.

(1) In addition to the enforcement measures specified in 527 CMR 9.07(L), the Marshal, Head of the Fire Department or their designees may after notice to the owner/operator of any underground storage tank, prohibit delivery of product to said tank or tanks for one or more of the following reasons:
  (a) Failure to properly install, operate and or maintain leak detection equipment; or
  (b) Failure to properly install, operate and or maintain spill, overfill, or corrosion protection equipment; or
  (c) Failure to maintain financial responsibility; or
  (d) Any other condition that endangers the public health, safety or environment.
(2) The Marshal, Head of the Fire Department or their designees shall issue the delivery prohibition order to be in effect by taking the following actions.
  (a) Delivering a written order to the underground storage tank owner or operator prohibiting the introduction of any product into the underground storage tank(s).
  (b) Affixing an orange delivery prohibition tag to the fill pipe of the effected tank or tanks.
  (c) Notifying, in writing, the product supplier (if known) of the delivery prohibition.

9.07: continued

(3) The owner/operator of the underground storage tank(s) subject a delivery prohibition order shall notify the official issuing said order upon correcting the condition(s) specified in 527 CMR 9.07(O(1)(a) through (d). The issuing official shall, within 24 hours (Saturdays, Sundays, and Holidays excepted) of notification of said corrections shall verify that the corrections have been made. If the conditions have been corrected, the official shall cause the delivery prohibition tag to be removed, and the product supplier notified.

(P) Third-party Inspections.

(1) Prior to August 8, 2010, and at a minimum once every three years thereafter the owner/operator of every underground storage tank shall at his/her own expense cause said tank(s) and related piping to be inspected by a third-party inspector, as defined in 527 CMR 9.02.

(2) Effective August 8, 2007, every newly installed underground storage tank and related piping shall be inspected by a third party inspector, as defined in 527 CMR 9.02, at the time installation is completed.

(3) The Third-party inspectors shall verify that the owner/operator possess the following documents.

(a) A current license for the storage of flammable and combustible liquids issued by the local licensing authority under M.G.L c. 148, § 13, if applicable; and

(b) A valid permit issued pursuant to 527 CMR 9.00, to maintain a new or existing underground storage tank facility; and

(c) A current, accurate and valid underground storage tank registration form (Form FP-290); and

(d) Copies of the manufacturer's operating instructions for all leak detection, tank monitoring and corrosion protection systems; and

(e) Current inspection/testing records for all leak detection, tank monitoring and corrosion protection systems; and

(f) Evidence of financial responsibility; and

(g) Records of any release reporting and investigation; and

(h) Permanent or temporary closure records.

(4) Third-party inspectors shall conduct an inspection of the following underground storage tank system components in accordance with the equipment manufacturers inspection/testing instructions and sound industry practices:

(a) Appropriate and operational corrosion protection (if applicable)

(b) Overfill prevention in place and operational.

(c) Spill prevention in place and operational.

(d) Tank and piping release detection is appropriate, in place and operational.

(e) Secondary containment is in place (if applicable) and operational.

(5) The third-party inspector shall record the results of the document verification, and the inspection on a form or in a format approved by the Marshal. This form shall be signed under the pains and penalties of perjury.

(6) The third-party inspector shall transmit one copy of the inspection form to the Head of the Fire Department and one copy to the Marshal within 14 business days from of the completion of inspection.

(7) The Head of the Fire Department and the Marshal shall routinely conduct random inspections of facilities that have been inspected by third -party inspectors to ensure integrity of the inspection.

(8) Nothing contained in 527 CMR 9.07(P) shall be construed to limit the authority of the Marshal, the Head of the Fire Department or their designees from conducting inspections of underground storage tank systems.

(9) The following facilities shall be exempt from third-party inspection requirements:

(a) Farm or residential tanks of 1100 gallons capacity or less used for storing motor fuel for noncommercial purposes.

(b) Residential or commercial tanks storing or having stored heating oil (fuel oil) for consumptive use on the premises.

(10) The Marshal may, after notice and an opportunity for a hearing, suspend or revoke the right of any third-party inspector to conduct inspections required under 527 CMR 9.07(P), if the Marshal determines that any of the following has occurred.

(a) An inspection was not conducted under the direct supervision of the third-party inspector submitting the inspection form.

9.07: continued

(b) third-party inspector is an owner or operator of the underground storage tank, an employee of the owner/operator of the underground storage tank, or a person having daily on-site responsibility of the underground storage tank.
(c) The third-party inspector submits false or misleading inspection reports.
(d) The third-party inspector fails to conduct an inspection in accordance with manufacturers inspection and testing instructions, and accepted industry practice.
(e) For any other reason which reasonably questions the qualifications of said inspector to continue to conduct further inspections.

(Q) Owner and Operator Training. (Reserved)

9.08: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 9.00 shall be considered a part of the requirements of 527 CMR 9.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 9.00: M.G.L. c. 22, § 14; c. 22D, § 4; c. 148, §§ 9, 10, 13, 28, 37, 38 and 38E.

527 CMR 10.00: FIRE PREVENTION, GENERAL PROVISIONS

Section

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10.01: Definitions

For the purpose of 527 CMR 10.00, the following terms shall have the meanings respectfully assigned to them:

ANSI. The American National Standards Institute

Approved. Approved by the State Fire Marshal.

Authority Having Jurisdiction. The head of the fire department.

Bulk Merchandising Retail Buildings. A building where sales areas contain:
(a) Combustible materials in piles greater than 12 feet in height or combustible materials on pallets, in racks or on shelves where the top of storage is greater than 12 feet in height or
(b) Combustible materials such as rubber tires, Group A plastics, flammable liquids, idle pallets and commodities with similar heat release characteristics where the top of storage is greater than six feet in height.

D.E.P. Massachusetts Department of Environmental Protection.

Fire Protection System. Shall include any devices, equipment and systems used to detect a fire, activate an alarm, suppress or control a fire or any combination thereof.

Fumigant. Includes any substance which by itself or in combination with any other substance emits or liberates a gas, fume or vapor used for the destruction or control of insects, fungi, vermin, germs, rats, or other pests, and shall be distinguished from insecticides and disinfectants which are essentially effective in the solid or liquid phases. Examples are methyl bromide, ethylene dibromide, hydrogen cyanide, carbon disulphide and sulfuryl fluoride.

Fumigation. The use within an enclosed space of a fumigant in concentrations which may be hazardous or acutely toxic to people.

10.01: continued

Hospital. A building used as a hospital or sanatorium, a convalescent or nursing home, or an infirmary, as such terms are defined in M.G.L. c. 111, § 71, and licensed as such occupancies.

High Hazard Occupancies. Those having contents which are liable to burn with extreme rapidity or from which poisonous fumes or explosions are to be feared in the event of fire.

Low Hazard Occupancies. Those having contents of such low combustibility that no self propagating fire therein can occur and that consequently the only probable danger will be from panic, fumes or smoke, or fire from some external source.

Open Air Parking Spaces. A place which may be occupied by an automobile or by a component which may be attached to or transported by an automobile, trailer or semi-trailer as defined in M.G.L. c. 90 and c. 148, § 56.

Nationally Recognized Testing Laboratory (NRTL). An organizatiuon which tests for safety and lists, labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00 (Appendix C).

Ordinary Hazard Occupancies. Those having contents which are liable to burn with moderate rapidity and to give off a considerable volume of smoke, but from which neither poisonous fumes nor explosions are to be feared in case of fire.

Place of Assembly. A room or space accommodating 50 or more individuals for religious, recreational, educational, political, social or amusement purposes, or for the consumption of food or drink, including all connected rooms or space with a common means of egress and entrance.

School. Any building or premises in which a regular course of public or private instruction is afforded to not less than ten pupils at one time, or to kindergartens, pre-primary or nursery schools where ten or more children are enrolled for instruction or care.

Smoking. Possessing a lighted cigarette, cigar, pipe, or other smoking article.

Thermal Insecticidal Fogging. The use of insecticidal liquids which are passed through thermal fog-generating units where they are, by means of heat, pressure and turbulence, transformed and discharged in the form of a fog or mist that is blown into an area to be treated.

10.02: Fire Extinguishers

(1) Any building or other premises, which, due to its location, construction, character or occupancy, or the manner of conducting business therein or thereupon is such that it is considered necessary by the head of the fire department, shall be provided with portable fire extinguishers installed and maintained in accordance with NFPA 10.

(2) Every school, college and university laboratory newly constructed or renovated, or any room used for similar purposes wherein corrosives or flammable liquids are handled or where open flame devices are used, shall be equipped with one or more Emergency Wash Systems. Emergency Wash Systems shall include Drench/Deluge Showers, Hand Held Body/Face Washers and Deck Mounted Drench Hoses. The permanently mounted showers shall be located as close to the main door of the laboratory as possible (to provide an escape route), but should not be located greater than 50' from an experimental area. The permanently mounted showers shall be capable of discharging a continuous spray at a rate of 30 gallons per minute. Emergency Wash Systems shall be tempered to between 70° and 90°F. Cold potable water shall be permitted in those locations where tempered water is not accessible or as permitted by the head of the fire department.

The Drench/Deluge Showers, Hand Held Body/Face Washers and Deck Mounted Drench Hoses shall be installed in accordance with ANSI Z-358.1 and 248 CMR.

Each existing laboratory not equipped with an Emergency Wash System shall be equipped with at least one approved Fire Blanket, and a sign that reads:

10.02: continued

"In Case of Clothing Fire
STOP, DROP and ROLL"

The location of the Emergency Wash System Stations, and Fire Blankets shall be clearly indicated by signs of contrasting color, either RED and WHITE or GREEN and WHITE. The signs shall be at least 70 square inches in area bearing the words "EMERGENCY WASH STATION", or "SAFETY SHOWER" or "FIRE BLANKET".

Every wash station shall be tested by the owner of the building or his designee twice annually (every six months) for proper flow and operation. The owner shall upon request, provide the fire department with the test result, (including but not limited to): date of test, station operation, system malfunctions, and the name of the person performing the test.

Each student shall be advised of the location and proper use of the above emergency safety equipment by the teacher, instructor, or person in charge of the class before the first experiment is conducted.

Each student shall also be instructed in the proper procedure for the extinguishment of clothing fires at least twice during the course, as directed by the head of the fire department. The installation and operation of each safety device noted above shall be in order before the commencement of any class conducting laboratory experiments.

10.03: General Provisions

(1) Any obstacle which may interfere with the means of egress or escape from any building or other premises, or with the access to any part of said building or premises by the fire department in case of fire, shall be removed from aisles, floors, halls, stairways and fire escapes. Doors and windows designated as exits shall be kept clear at all times.

(2) Such aisles, floors, halls, stairways, fire escapes, doors and windows shall be kept in good repair and ready for use, and shall be kept properly lighted as required by 780 CMR.

(3) Any vessel moored to or anchored near any dock or pier or located within the jurisdiction of any harbor or on any other water of the Commonwealth, which vessel is a danger by reason of explosion or fire, shall remain secure or be secured to such dock, mooring, or anchorage until the fire has been suppressed or the removal is ordered by the head of the fire department or his designated representative.

(4) Accumulations of Waste. Accumulations of waste paper, wood, hay, straw, weeds, litter or combustible or flammable waste or rubbish of any kind shall not be permitted to remain upon any roof or in any court, yard, vacant lot, alley, parking lot or open space, beneath a grandstand, pier, wharf or other similar structure. All weeds, grass, vines or other growth, when same endangers property, or is liable to be fired, shall be cut down and removed by the owner or occupant of the property. All combustible rubbish, oily rags or waste material when kept within a building, shall be stored in accordance with 527 CMR 34.00. Storage shall not produce conditions which in the opinion and judgment of the head of the fire department will tend to create a nuisance or a hazard to the public health, safety or welfare.

(5) Materials Storage.

(a) General. The storage of combustible or flammable material shall be confined to approved storage areas.

(b) Permit required: A person shall not store in any building or upon any premises in excess of 2,500 cubic feet gross volume of combustible empty packing cases, boxes, barrels or similar containers; or rubber tires, baled cotton, rubber, cork or other similarly combustible material without having obtained a permit from the head of the fire department.

(c) Inside storage. Storage in buildings and structures shall be orderly, shall not be within two feet of the ceiling, and shall be located so as not to obstruct egress from the building.

(d) Outside storage. The outside storage of combustible or flammable materials shall not be more than 20' in height and shall be compact and orderly. Such storage shall be located as not to constitute a hazard and not less than 25' from any other building on the site or from a lot line.

(6) Open Flame Devices. Open flame devices and special food service devices shall comply with the requirements of NFPA 101.

10.03: continued

(7) Chimneys and Heating Appliances.

(a) General. All existing chimneys, smokestacks or similar devices for conveying smoke or hot gases to the outer air and all stoves, ovens, furnaces, incinerators, boilers or any other heat producing devices or appliances shall be constructed in accordance with 780 CMR and BOCA Mechanical Code and maintained in accordance with NFPA 54 and 211 where the provisions of 527 CMR 10.00 does not specifically cover conditions and operations, and in such a manner as not to create a fire hazard.

(b) Unsafe Heating Appliances. The head of the fire department shall order the sealing (preventing the use) of any existing stove, oven, furnace, incinerator, boiler or any other heat producing device or appliance found to be defective or in violation of code requirements for existing appliances after giving 24 hours notice to this effect to any person, owner, firm, agent or operator in charge of same. However, the head of the fire department shall seal any device or appliance without notice when inspection shows the existence of an immediate fire hazard or when imperiling human life. The sealed defective appliance shall remain withdrawn from service until all necessary repairs or alterations have been made.

(c) Unauthorized Seal Removal. No person or user, firm or agent shall continue the use of any device or appliance which has been sealed or ordered sealed under 527 CMR 10.03(7)(b), unless written authority to remove said seal is given by the head of the fire department.

(d) Incinerator Operations. All incinerating operations shall be subject to the following restrictions and a sign of permanent design, furnished by the owner, shall be posted in a conspicuous location at or near the incinerator to inform the operators of said restrictions:

1. Fuel-fired incinerators shall be preheated 30 minutes before using.
2. Only competent operators shall be allowed to operate the incinerator.
3. After loading the main combustion chamber, the feed door shall be closed until the combustion cycle is complete.
4. The waste material ash compartment shall be cleaned regularly.
5. Waste matter shall not be burned, under permit or otherwise, which shall, in burning, cause or create a dense smoke or odor.
6. Chimney flues or vent pipes connected to a permanent heating device or incinerator shall be inspected, and cleaned when required, by the owner or his designee at least once each year. Such person shall inspect, maintain and clean, when necessary, each incinerator at least once each six months.
7. Suitable spark arresters shall be installed and maintained in incinerators and in chimneys connected with permanent wood-burning furnaces.
8. On complaint of a violation of 527 CMR 10.03(7)(d)1. through 10.03(7)(d)7. the head of the fire department shall investigate and report same to the authority having jurisdiction of those items.

(8) Commercial Kitchen Exhaust Systems and Maintenance. *See* 527 CMR 11.00: *Commercial Cooking Operations*. Inspection, maintenance, testing and cleaning within the scope of NFPA 96, shall be performed in accordance with NFPA 96. Documentation shall be available for inspection by the head of the fire department.

(9) Fire Doors. All required fire resistant rated doors or smoke barriers shall be maintained in good working order including all hardware necessary for the proper operation thereof. The use of door stops, wedges and other unapproved hold-open devices shall be prohibited. Where it is desired to keep the doors open, the head of the fire department shall require the installation of approved automatic closing devices in accordance with 780 CMR.

10.03: continued

(10) Fire Lanes.

(a) Designation. The head of the fire department shall require and designate public or private fire lanes as deemed necessary for the efficient and effective use of fire apparatus. Fire lanes shall have a minimum width of 18'.

(b) Obstructions. Designated fire lanes shall be maintained free of obstructions and vehicles and marked in an approved manner.

(c) Maintenance. All designated fire lane signs or markings shall be maintained in a clean and legible condition at all times and replaced when necessary to insure adequate visibility.

(11) Electrical.

(a) Abatement of Electrical Hazards. When any electrical hazards are identified, such conditions shall be abated. All identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the electrical code official.

(b) Refer to 527 CMR 12.00 (Massachusetts Electrical Code)

(12) Asphalt (Tar) Kettles.

(a) General. Any asphalt (tar) kettle beneath which is maintained any open fire, heated coals or ashes shall not be transported or permitted to be transported over any highway, road or street.

(b) Exception. Asphalt (tar) kettles being used for street repair work shall only be transported in an open fired condition when the asphalt (tar) kettle unit is towed or moved at a speed not to exceed ten miles per hour (16 kph). A safety vehicle with warning lights shall follow the asphalt (tar) kettle when the open fired asphalt (tar) kettle is being transported or moved.

(c) Restrictions. Asphalt (tar) kettles shall not be used inside any building or on any roof top under 70 feet in height. Fired asphalt (tar) kettles shall not be left unattended.

(d) Temporary Use of Asphalt (tar) Kettles on Roofs Over 70 Feet in Height. There shall not be an exposed flame on roof top kettles. Asphalt (tar) kettles are to be placed on a non-combustible surface away from air-conditioning and ventilation units and are not to be left unattended. The attendant must man the kettle for a period of one hour after operation or until the material reaches a temperature of 315°F. Propane cylinders must be secured in place; no spare cylinders are to be stored on roofs and all cylinders are to be removed at the end of each work day. Propane cylinders must be kept away from air-conditioning and ventilation units. A 20 B:C multipurpose fire extinguisher must be used on all roof top asphalt (tar) kettles. A permit shall be obtained from the head of the fire department at least two working days prior to the placement of a tar kettle on a roof.

(e) Fire Protection. There shall be a minimum of one 20 B:C multipurpose portable fire extinguisher within 30 feet of each asphalt (tar) kettle during the period such kettle is in use, and one additional minimum 20 B:C multipurpose portable fire extinguisher on the roof being covered. Every kettle, when in operation, shall be equipped with a tight fitting cover. A kettle, when in operation, shall be placed a safe distance from any combustible material or buildings.

(f) LPG Cylinder Protection. When liquefied petroleum gas cylinders or containers are utilized for fueling asphalt (tar) kettles, the LPG cylinder shall be protected against vandalism and tampering.

1. All LPG cylinders and containers shall be placed in a secured area for protection against tampering.
2. LPG cylinders and containers which cannot be secured in a protected area shall be removed.
3. The storage of LPG cylinders on roof tops shall be prohibited.
4. Refer to 527 CMR 6.00 (LPG).

(13) Hazards to Means of Egress.

(a) Obstructions. No person shall at any time place an encumbrance of any kind before or upon any fire escape, balcony or ladder intended as a means of escape from fire. The means of egress from each part of the building, including stairways, egress doors, and any panic hardware installed thereon, aisles, corridors, passageways and similar elements of the means of egress, shall at all times be maintained in a safe condition and shall be available for immediate use and free of all obstructions.

10.03: continued

(b) Storage. Combustible or flammable material shall not be placed, stored or kept in any portion of an exit or elevator car or hoistway or at the bottom of a stairway, fire escape or other means of escape unless such space is enclosed and protected as required by 780 CMR. Such storage shall be located so that the presence or burning of the materials would not obstruct or render hazardous the means of egress.
(c) Display. Aisles, passageways or stairways in any building shall not be obstructed with tables, showcases, Christmas trees, vending machines or other obstructions during hours when the building is open to the public, nor shall such obstructions be located in such a manner as to interfere with firefighting access. Display boards, signs, coat racks and any other movable equipment that obstructs the path of egress travel shall be prohibited. A mirror shall not be placed in or adjacent to any means of egress in such a manner as to confuse the direction of egress. Draperies and similar hangings obscuring an exit shall be prohibited.
(d) Exterior egress. All exterior stairways and fire escapes shall be kept free of snow and ice. Any fire escape or exterior stairway found to be in a state of deterioration or determined to be unsafe by the head of the fire department shall be repaired immediately. Depending on the structural condition, a load test of any fire escape shall be conducted before it is returned to service.
(e) Means of Escape. In occupancies in Groups R and I-1, bars, grilles or screens placed over emergency escape windows shall be releasable or removable from the inside without the use of a key, tool or force greater than required for normal operation of the window.

(14) All fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines used in areas including but not limited to those containing flammable gases or vapors, vapors of flammable liquids, volatile flammable liquids and their vapors or other areas where flammable gases are normally confined, combustible metal dusts and other combustible dusts, or areas where ignitable fibers or materials producing combustible flyings are handled shall comply with NFPA 505.

(15) No person or entity may install any fire protection system in any new or existing building or structure without first obtaining a permit therefor from the head of the fire department.

(16) Conflicting Requirements. Where requirements of reference standards conflict with statutes or regulations in effect in the Commonwealth of Massachusetts, those statutes or regulations shall take precedence unless otherwise modified by the State Fire Marshal.

10.04: Safety Cans

Flammable or combustible liquids stored or transported in other than a cargo tank, portable tank or transfer tank shall be in approved containers. Approved containers shall include those built to U. S. DOT standards, listed and labeled by an NRTL, or approved by the State Fire Marshal. When not in use, containers shall be in a secured, upright position with all openings tightly closed. Refer to 527 CMR 14.00 for additional provisions for the storage, handling and use of flammable and combustible liquids.

10.05: General Storage

(1) Crating, storage, piling, etc., of empty packing boxes, cases, or barrels of a combustible nature shall be restricted to segregated areas in separate buildings or separate fire areas.

(2) Areas for outdoor storage shall be approved where the following are available: adequate municipal fire and police protection; access roads for use by the fire apparatus; adequate water supply; and, no exposure hazard.

(3) The entire storage site shall be kept free from unnecessary accumulations of combustible materials. Weeds or grass and dry vegetation shall be kept down and a regular procedure shall be provided for the periodic cleanup of the entire area.

10.05: continued

(4) Tarpaulins used for the protection of storage against the weather shall be flameproofed.

(5) The entire premises shall be approved by the head of the fire department.

10.06: Fumigation and Thermal Insecticidal Fogging

(1) General. fumigation and thermal insecticidal fogging operations shall conform to the provisions of 527 CMR 10.06 and all other applicable requirements of 527 CMR 10.00, and shall apply to the use of gases, liquids, or solids in connection therewith.

(2) Permit required. In order to provide the head of the fire department with notice that fumigation or fogging is to be done and so that operations which must be performed by the fire department may be adjusted to these conditions, no person shall perform fumigation or fogging without a permit from the head of the fire department.

NON-TEXT PAGE

10.06: continued

(3) Fumigating Operations. No warehouse, factory or commercial building shall be fumigated by the use of any volatile flammable liquid, toxic substance, or any material requiring flame, unless a permit has been obtained therefor from the head of the fire department. Any building being so fumigated shall be posted at all entrances to give warning of the fumigant hazard during the entire fumigating operation.

(4) Fire Safety Requirements.

(a) General. Any building ship or vessel where fumigation and thermal insecticidal fogging operations are conducted shall comply with the following fire protection and safety requirements.

(b) Sources of Ignition. All fires, open flames and similar sources of ignition shall be eliminated from the space under fumigation or thermal insecticidal fogging.

(c) Electricity. Electricity shall be shut off, except that circulating fans which are to be used shall be designed and installed so as not to create an ignition hazard. Electrical equipment shall be designed and installed in accordance with 527 CMR 12.00 (Massachusetts Electrical Code).

(d) Notification. The head of the fire department shall be notified in writing at least 24 hours before any building or structure is to be closed in connection with the use of any toxic or flammable fumigant. Such notification shall give the location of the building, structure, ship or enclosed space to be fumigated or fogged as well as its character and use, the fumigants or insecticides to be used, the person or persons in charge of the operation and the date and time when fumigation or fogging will be started. Notice of any fumigation or thermal insecticidal fogging shall be served with sufficient advance notice upon the occupants of any building or other enclosed space involved in the operation to enable them to evacuate the premises.

(e) Warning signs. Suitable warning signs indicating the danger, type of chemical involved and recommended precautions shall be posted on all doors and entrances to the premises and upon all gangplanks and ladders from the deck, pier or land to the ship. Such notice is to be printed in red ink on white background. Letters in the signs are to be at least two inches in height and shall state the date and time of the operation, the name of the operator in charge, together with a warning to the effect that the premises so occupied shall be vacated at least one hour before the operation is started and shall not be re-entered until the danger signs have been removed by the proper authorities.

(f) Watchman. During the period fumigation is in progress, except when fumigation is conducted in a gastight vault or tank, a capable, alert watchman or watchmen shall remain on duty at the entrance or entrances to the building, ship, or enclosed space fumigated until after the fumigation is completed and until the premises are properly ventilated and again safe for human occupancy. Sufficient watchmen shall be provided to prevent any person from entering the building, ship or enclosed space under fumigation without being observed.

(g) Thermal Insecticidal Fogging Liquids. Thermal insecticidal fogging liquids with a flash point below 100° F (38° C) shall not be used.

10.07: Smoking

(1) Smoking shall be prohibited in factories, workshops, mercantile establishments or warehouses, where the material being handled in and about such structure is of a flammable nature or where such structures are of a combustible construction which may, in the opinion of the head of the fire department, constitute a fire hazard. Such structures shall be provided with a smoking area or areas for employees, to be approved by the head of the fire department.

(2) Smoking shall be prohibited in every assembly theater classified in use group A-1 in 780 CMR. Such structures shall be provided with a room or area to be designated as a "smoking area." Such room or area shall be of a size suitable to accommodate the number of smokers requiring such facility. The head of the fire department shall approve such areas.

(3) Smoking shall be prohibited in schools, colleges, universities, public buildings and institutions except that smoking shall be permitted in designated areas. Such areas shall be approved by the head of the fire department. Such room or area shall be of a size suitable to accommodate the number of smokers requiring such facility.

10.07: continued

(4) Smoking shall be prohibited on all docks, wharves and waterfront areas, except that smoking may be permitted in smoking areas so designated and approved by the head of the fire department.

(5) Smoking may be permitted in "no smoking areas" of public halls and special halls only when they are not being used as auditoriums requiring fixed seats and aisles, if the head of the fire department so approves.

(6) Each smoking area shall be equipped with at least the following items: a bucket of sand or other suitable receptacles for the disposal of smoking articles; a fire extinguisher for class A fires. The head of the fire department may require an increase in the number of the above items or additional safety appliances before approving such smoking areas.

(7) Durable red and white signs with the words "NO SMOKING" in letters not less than three inches in height, shall be conspicuously posted in and about the "NO SMOKING AREAS" referred to in 527 CMR 10.07(2) through 10.07(4).

(8) Durable green and white signs with the words "SMOKING AREA" in letters not less than three inches in height, shall be conspicuously posted in and about the smoking areas designated in 527 CMR 10.07(2) through 10.07(5).

10.08: Hospitals

(1) All hospitals shall conform to the following fire drill regulations:
(a) Each hospital shall formulate a plan for the protection and evacuation of all persons in event of fire; such plan shall be presented to and approved by the head of the fire department. All employees shall be kept informed of their duties under such plan.
(b) The head of the fire department shall visit each hospital at least four times each year for the purpose of ascertaining whether the supervisors attendants and other personnel are familiar with the approved plan of evacuation.

(2) Use and storage of combustible foam cellular plastic decubitus mattress pads shall conform to the following:
(a) The foam used for the pads shall meet the flammability regulations of the California Bureau of Home Furnishings Bulletin 117, and the package shall be labeled accordingly.
(b) The use of such pads shall be limited to patients for whom the pads are a medical necessity.
(c) No smoking or smoking materials shall be allowed by patients, visitors, or hospital employees in any room or area where decubitus pads are stored or used.
(d) Decubitus pads shall be disposed of in a safe manner acceptable to the head of the fire department. Only covered refuse containers shall be used. The disposal shall be such that the pads are not mixed with ordinary combustible rubbish inside the hospital.
(e) The bulk storage shall be only in a room protected by automatic sprinklers or in a separate storage building.
(f) Decubitus pads shall not be washed and reused and shall bear warning label so stating.

10.09: Schools

All schools shall conform to the following fire drill regulations:

(1) The responsible school official in charge of the school or the school system shall formulate a plan for the protection and evacuation of all persons in the event of fire, and shall include alternate means of egress for all persons involved; such plan shall be presented to and approved by the head of the fire department.

(2) The headmaster or person in charge of each school shall see that each class instructor or supervisor shall receive proper instructions on the fire drill procedure specified for the room or area in which that person carries out his duties before he assumes such duties.

(3) Every student in all schools shall be advised of the fire drill procedure or shall take part in a fire drill within three days after entering such school.

10.09: continued

(4) The head of the fire department, or person designated by him, shall visit each school at least four times each year for the purpose of conducting fire drills and questioning the teachers and supervisors. These drills shall be conducted without advance warning to the school personnel other than the person in charge of the school at the time.

(a) Records. A record of all fire exit drills shall be kept on the premises and persons in charge of such occupancies shall file written reports at least twice a year with the head of the fire department giving the following information:

1. Time of drill.
2. Date of drill.
3. Weather conditions when occupants were evacuated.

NON-TEXT PAGE

10.09: continued

4. Number of occupants evacuated.
5. Total time for evacuation.
6. Other information relevant to the drill.

(b) Evacuation. Fire exit drills shall include complete evacuation of all persons from the building.

(5) Paper materials displayed in Educational Use Occupancies, as defined in 780 CMR: *The Massachusetts State Building Code*, shall be permitted on walls only in accordance with 527 CMR 10.09(5).

(a) Classrooms. Paper materials displayed shall not exceed 20% of the total wall area. Paper materials displayed shall be attached directly to the walls and shall not be permitted to cover an egress door or be placed within five feet of an egress door. When determining wall areas in accordance with 527 CMR 10.09(5)(a), door and window openings shall be included.

Exception 1: Paper material displayed in fully enclosed viewing cabinets with glass or polycarbonate viewing panels or covered with glass or polycarbonate sheet material in accordance with the Building Code, 780 CMR. (Thermoplastic materials such as *Plexiglas®* are not acceptable.)

Exception 2: Flame retardant paper material used for display.

Exception 3: Paper material displays may cover up to 50% of the total wall area in classrooms that are fully sprinklered in accordance with 780 CMR: *The Massachusetts State Building Code*.

(b) Exit Access Passageways, Assembly Areas and Corridors. Paper materials displayed shall not exceed 10% of the surface area of any wall. Such paper material shall be positioned in such manner to avoid concentration of materials to reduce flame spread in the event of a fire. In no event shall any one grouping exceed a maximum horizontal measurement of 12 feet and a maximum vertical measurement of six feet. Groups of paper material shall be allowed as long as there is space between each group equal to the horizontal width of the largest adjacent group. Paper material used for display shall be attached directly to the walls and shall not be permitted to cover an egress door or be placed within five feet of an egress door.

Exception 1: Paper material displayed in fully enclosed viewing cabinets with glass or polycarbonate viewing panels or covered with glass or polycarbonate sheet material in accordance with the Building Code, 780 CMR. (Thermoplastic materials such as *Plexiglas®* are not acceptable.)

Exception 2: Flame retardant paper material used for display.

Exception 3: Paper materials displayed shall not exceed 50% of the surface area of any wall in buildings equipped with automatic sprinklers in accordance with 780 CMR: *The Massachusetts State Building Code*. Such paper material shall be positioned in such manner to avoid concentration of materials to reduce flame spread in the event of a fire.. In no event shall any one grouping exceed a maximum horizontal measurement of 12 feet and a maximum vertical measurement of six feet. Groups of paper material shall be allowed as long as there is space between each group equal to at least ½ the horizontal width of the largest adjacent group. Paper materials displayed shall be attached directly to the walls and shall not be permitted to cover an egress door or be placed within five feet of an egress door.

(c) Exits and Enclosed Exit Stairs. Displayed paper materials shall not be permitted in exits and enclosed exit stairs.

(d) The provisions of 527 CMR 10.09(5) shall not prohibit the posting of exit signage or evacuation plans established in accordance with 527 CMR 10.09(1).

(e) The provisions of 527 CMR 10.09(5) shall not be applicable to any election materials required by law to be posted during any local, state or federal election.

10.10: Theaters

(1) Each theater shall formulate a plan for the protection and evacuation of all persons in event of fire; such plan shall be presented to and approved by the head of the fire department. All employees shall be kept informed of their duties under such plan.

(2) The head of the fire department shall visit each theater at least four times each year for the purpose of ascertaining whether the manager and other personnel are familiar with the approved

10.11: Housing for the Elderly

(1) All housing for the elderly complexes comprised of six or more dwelling units shall conform to the following fire drill regulations:

(a) Each such housing complex administrator shall formulate a plan for the protection and evacuation of all persons in event of fire, such plan shall be presented to and approved by the head of the fire department. All employees and residents shall be kept informed of their plan of action and/or evacuation route under such plan.

(b) The head of the fire department shall visit each such complex at least four times each year to:

1. Conduct a fire drill; or
2. If he deems a fire drill inadvisable because of the advanced age or degree of physical disability of its residents, to ascertain if all occupants are familiar with the approved plan of evacuation.

10.12: General Use Buildings

(1) Any inner court not protected by a roof which will support a load of 40 lbs. per square foot shall have a substantial parapet or barrier at least 42" high. A skylight shall be constructed to support 40 lbs. per square foot or shall have a substantial parapet or barrier at least 30" high.

(2) Reserved.

(3) The head of the fire department shall, when he has knowledge, or when in his opinion any electrical wiring or equipment in or about any building or other structure is defective or improper, report the same in writing to the proper authority or authorities for enforcement of the laws relative thereto.

(4) General requirements for the care and/or removal of gasoline tanks in unregistered or unusable motor vehicles.

(a) Any person, firm, corporation, society, association or partnership who keeps an unregistered motor vehicle in running condition which is equipped with a gasoline tank shall make certain that the vehicle is garaged or kept under surveillance in the same manner as a registered vehicle.

(b) Any person, firm, corporation, society, association or partnership who keeps a motor vehicle outside of a garage for a period in excess of 30 days, which, in the opinion of the head of the fire department or an inspector designated by him, is in such repair that it cannot be used or that it appears to him that it is not intended to be used, said person, firm, corporation, society, association or partnership shall be responsible for draining the gasoline from the fuel tank and immediately filling said tank with water equal to at least 5% of the volume of the tank within 24 hours after written notification by the head of the fire department or inspector so designated. Any unused diesel fuel, gasoline or mixture of fuels and water, shall be disposed of in accordance with the requirements of the Massachusetts Department of Environmental Protection.

(c) Any person, firm, corporation, society, association or partnership who removes a fuel tank from a motor vehicle shall make certain that such tank has been drained prior to removal from said vehicle.

(d) Any person, firm, corporation, society, association or partnership who keeps or disposes of a fuel tank which has been detached from a motor vehicle, shall immediately make certain that such tank is drained and filled with water.

10.13: Emergency Planning and Preparedness

(1) Scope. The development of emergency plans, training and conducting of fire exit drills shall comply with the applicable requirements of 527 CMR 10.00 and the provisions of 527 CMR 10.13.

(2) Places of Assembly.

(a) General. The employees or attendants of places of public assembly shall be trained and drilled in the duties they are to perform in case of fire, panic or other emergency.

(b) Egress plan. A plan showing the occupant load, seating diagram and location of exits and of aisles leading thereto shall be submitted to the head of the fire department and an approved copy shall be kept on the premises.

10.13: continued

Exception: Temporary deviation from the specifics of the approved seating diagram shall be permitted provided the occupant load is not increased and the intent of 527 CMR 10.17 is maintained.

(c) Exit Announcements. The owner or operator of any business or activity located within a Place of Assembly classified as an A-1 or A-2 use group under 780 CMR, the State Building Code, shall make an audible announcement prior to the start of each program or performance that notifies occupants of the location of the exits to be used in case of a fire or other emergency.

Such announcement may be made in person or by recorded communication and shall be communicated in such a reasonable manner to assure that all persons in attendance are aware of the location of the exits. Owners or operators of assemblies involving video or cinema presentations may use such video or cinematic medium to communicate such audible announcement or projected image. Such announcement or projected image shall include the location of egress routes or areas of rescue assistance for use by persons with disabilities.

In addition to the audible announcements required by 527 CMR 10.13, if any written program, playbill or similar document is distributed prior to each program or performance, such document shall include a diagram of the location of all egress routes or areas of rescue assistance for use by persons with disabilities.

(d) Designation of a Crowd Manager. Effective July 1, 2009, the owner or operator of the business or activity located in any Place of Assembly classified as an A-2 use group under 780 CMR, the State Building Code, shall designate a crowd manager.

The crowd manager shall be at least 21 years of age, shall be the owner or operator of the business or shall be under the direct control and supervision of said owner or operator. The crowd manager shall be responsible for the following:

1. maintaining clear exits, assuring that there is no overcrowding, initiating a fire alarm if necessary, directing occupants to exits; and
2. General fire and life safety awareness of employees and occupants, including assuring that exit announcements are made in accordance with 527 CMR 10.13(2)(c); and
3. Accurately completing the safety plan checklist required by 527 CMR 10.13(2)(e).

The crowd manager shall be knowledgeable about the responsibilities required in 527 CMR 10.13(2)(d) and (e). The Marshal shall develop training materials and the method to assure that said crowd managers are knowledgeable about their responsibilities.

(e) Fire and Building Safety Checklist. Effective July 1, 2009, the crowd manager required by the provisions of 527 CMR 10.13(2)(d) shall be responsible for the completion of the Fire & Building Safety Checklist, as prescribed by the Marshal. This checklist shall include, but not be limited to, the routine safety check of existing fire protection systems, fire extinguishers, signage, interior finish, exits, unobstructed egress, crowd control procedures, employee training and building capacity restrictions. This checklist shall be completed as required by the Marshal and shall be kept on the premises for at least one year. The checklist shall be subject to inspection by the head of the fire department, the Marshal or their designee.

(3) Special Residential Use Group.

(a) Evacuation Plan. The administration of every facility shall have in effect and available to all supervisory personnel written copies of a plan for the protection of all persons in the event of fire and for their evacuation to areas of refuge and from the building when necessary. The plan shall include special staff actions including fire protection procedures needed to ensure the safety of any resident and shall be amended or revised upon admission to the home of any resident with unusual needs. All employees shall be periodically instructed and kept informed in respect to their duties and responsibilities under the plan. Such instruction shall be reviewed by the staff at least every two months. A copy of the plan shall be readily available at all times within the facility.

(b) Resident Training. All residents capable of assisting in their evacuations shall be trained in the proper actions to take in the event of a fire. The training shall include actions to take if the primary escape route is blocked. If the resident is being given rehabilitation, training in fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program. Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

10.13: continued

(c) Fire Exit Drills. Fire exit drills shall be conducted at least six times per year, two times a year on each shift. Twelve drills shall be conducted in the first year of operation. The drills are not required to be unannounced.
(d) Evacuation. Fire exit drills shall involve the actual evacuation of all residents to a selected assembly point and shall provide residents with experience in exiting through all required exits. All credited exits shall be used during fire drills.

Exception: Actual exiting from windows shall not be required to meet the requirements 527 CMR 10.13; opening the window and signaling for help shall be an acceptable alternative.

(4) Use Group I-2 --Incapacitated Care.
(a) Evacuation Plan. The administration of every building of Use Group I-2 shall have in effect and available to all supervisory personnel written copies of a plan for the protection of all persons in the event of fire and for their evacuation to areas of refuge and from the building when necessary. All employees shall be periodically instructed and kept informed with respect to their duties under the plan. A copy of the plan shall be readily available at all times in the telephone operators position or at the security center.
(b) Bed Mobility. Every bed intended for use by health care occupants shall be easily movable under conditions of evacuation and shall be equipped with the type and size of casters to allow easy mobility, especially over elements of the structure such as expansion plates and elevator thresholds.

Exception: Beds intended for use in areas limited to patients such as convalescent, self-care, or mental health patients.

(c) Fire Exit Drills. Fire exit drills in buildings of Use Group I-2 shall include the transmission of a fire alarm signal and simulation of emergency fire conditions except that the movement of infirm or bed-ridden patients to safe areas or to the exterior of the building shall not be required. Drills shall be conducted quarterly on each shift to familiarize facility personnel with signals and emergency action required under varied conditions. At least 12 drills shall be held every year. When drills are conducted between 9:00 p.m. (2100 hours) and 6:00 a.m. (0600 hours), a coded announcement shall be permitted instead of audible alarms
(d) Records. A record of all fire exit drills shall be kept on the premises and persons in charge of such occupancies shall file written reports at least twice a year with the head of the fire department giving the information listed in 527 CMR 10.09(4)(a).
(e) Employee Training. Employees shall be instructed in life safety procedures and devices.

(5) Use Group I-3 -- Restrained.
(a) Emergency Plan. The administration of every facility shall have in effect and provided to all supervisory personnel written copies of a plan for the protection of all persons in the event of fire and for their evacuation to areas of refuge and from the building when necessary. All employees shall be instructed and drilled with respect to their duties under the plan. The plan shall be coordinated with and reviewed by the head of the fire department.
(b) Employee Training. Employees shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment. With respect to new staff, such training shall be provided promptly upon entrance on duty. With respect to existing staff, refresher training shall be provided at least annually.
(c) All building of Use Group I-3, or those portions of buildings having such occupancy, shall be provided with 24 hour staffing. Staff shall be within three floors or 300' horizontal distance of the access door of each resident housing area. In Use Condition III, IV and V as defined in 780 CMR, the arrangement shall be such that the staff involved can start release of locks necessary for emergency evacuation or rescue and initiate other necessary emergency actions within two minutes of alarm.
(d) Notification. Provisions shall be made so that residents in Use Conditions III, IV, and V as defined in 780 CMR can readily notify staff of an emergency.
(e) Keys. All keys necessary for unlocking doors installed in means of egress shall be individually identified by both touch and sight.

10.13: continued

(6) High Rise Buildings.

(a) General. The owner or other person having charge of buildings identified as high-rise buildings in 780 CMR shall be required to prepare and submit to the head of the fire department for review and approval a fire safety plan and evacuation procedure as set forth in 527 CMR 10.13(6).

(b) Fire Safety Plan. The fire safety plan shall be distributed to the tenants and building service employees by the owner or agent. Tenants shall distribute to their employees applicable parts of the fire safety plan which affect their action in the event of a fire or emergency.

(c) Responsibility to Update Fire Safe Plan. It shall be the responsibility of the owner or agent to promptly update the fire safety and evacuation procedures upon changes in occupancy, use or physical arrangement.

(7) Marking or Identifying Certain Buildings that are Especially Unsafe in the Case of Fire.

(a) Any building determined to be especially unsafe in case of fire, under the provisions of 780 CMR 121.2 shall be identified and caused to be marked by the building official, with the cooperation of the head of the fire department, to indicate the degree of hazard.

(b) In marking such buildings, the following symbols shall be used:

⧅ This symbol shall mean that interior hazard exists to such a degree that interior operations shall be conducted with extreme caution. This symbol shall not in any way limit the discretion of the on scene Incident Commander in directing operations that the Incident Commander deems necessary.

☒ This symbol shall mean that exterior or interior hazards exists to such a degree that consideration should be given to conduct operations from the exterior only. This symbol shall not in any way limit the discretion of the on scene Incident Commander in directing operations that the Incident Commander deems necessary.

(c) Markings shall be applied on the front of the building at or above the second floor level, where practical, between openings such that they are visible from the street. Markings may be applied to the sides or the rear of a building if the head of the fire department deems such placement necessary. Markings shall also be applied in a conspicuous place near every entrance and on penthouses. Markings shall not be applied over doors, windows, or other openings where they may be obscured by smoke or fire.

(d) Markings shall be a minimum of 24 inches by 24 inches. Markings shall either be on a placard with a reflective background or painted with a reflective paint of contrasting color directly on the surface of the building. Stripes and borders outside of the marking shall be a minimum of two inches wide.

(e) All markings shall bear a date as to when applied or the date of the most recent inspection.

(f) Prior to receiving a mark, all buildings shall be inspected thoroughly by the head of the fire department.

10.14: Hazard Abatement in Existing Buildings

(1) General.

(a) Scope. The provisions of 527 CMR 10.14 are to provide a reasonable degree of safety to persons occupying existing buildings that do not conform with the minimum requirements of 780 CMR by requiring the following alterations to such existing buildings.

(b) Application of Other Codes. All alterations to an existing building which are caused directly or indirectly by the enforcement of 527 CMR 10.00 shall be done in accordance with the applicable procedures and provisions of 780 CMR, 248 CMR, the BOCA Mechanical Code and 527 CMR 12.00.

(c) Continued Maintenance. All service equipment, means of egress devices and safeguards which are required by 527 CMR 10.00 or which were required by a previous statute or another regulation in a building or structure when erected, altered or repaired shall be maintained in good working order. The requirements of 527 CMR 10.14 are not to provide the basis for removal or abrogation of fire protection and safety systems and devices in existing buildings. These requirements are intended to require that existing buildings which do not comply with 527 CMR 10.00 be altered to provide a minimum level of safety as required herein.

10.14: continued

(2) Elevator Recall. Required. Elevator recall shall conform to the requirements of 524 CMR.

(3) Mechanical Equipment Control. Smoke and Heat Detection. Each recirculating air system which serves more than one floor in buildings which exceed six stories in height shall be equipped with approved smoke and heat detection devices in accordance with the BOCA Mechanical Code. The devices shall stop the fan(s) automatically and shall be of the manual reset type. Automatic fan shutdown is not required when the system is part of an approved smoke removal or control system, or hazardous exhaust system.

10.15: Bowling Establishments

(1) General.
(a) Scope. The equipment, processes and operation of bowling alleys and establishments shall comply with the applicable requirements of 527 CMR 10.00 and the provisions of 527 CMR 10.15.
(b) Permit Required. A permit shall be obtained from the head of the fire department for bowling pin refinishing and bowling lane resurfacing operations involving the use and application of flammable liquids or materials.

(2) Special Conditions.
(a) General. In the operation and maintenance of bowling establishments the following conditions shall be observed.

10.15: continued

(b) Lane resurfacing operations. Resurfacing operations shall not be carried on while the establishment is open for business. The head of the fire department shall be notified when the bowling lanes are to be resurfaced. Mechanical ventilation shall be provided to adequately remove flammable vapors. Heating, ventilating or cooling systems employing recirculation of air shall not be operated during resurfacing operations or within one hour following the application of flammable finishes. All electric motors or other equipment in the area which might be a source of ignition shall be shut down, and all smoking and use of open flame shall be prohibited during the application of flammable finishes and for one hour thereafter.

(c) Pin refinishing. Pin refinishing involving the application of flammable finishes shall be done only in a special room meeting the requirements of 780 CMR. Smoking shall be prohibited at all times in refinishing rooms.

(d) Power tools. All power tools in the room shall be effectively grounded. A substantial metal box or other receptacle approved by the head of the fire department shall be provided for catching dust of lathes and sanding or buffing machines thrown off during operation. The contents shall be removed daily and disposed of safely.

(e) Storage of flammable liquids. Storage of flammable or combustible liquids in such rooms shall not exceed a combined aggregate of 60 gallons, in original metal containers or in approved safety containers of five-gallon individual capacity in accordance with 527 CMR 14.00, where provisions of 527 CMR 10.00 do not specifically cover conditions and operations.

(f) Waste Materials. A metal waste can with self-closing cover shall be provided for all waste materials and rags, and the contents shall be disposed of daily in accordance with state and federal regulations.

10.16: Dust Explosion Hazards

(1) General.

(a) Scope. Equipment, processes and operations which involve dust consisting of pulverized particles of any material which, if mixed with air in the proper proportions, becomes explosive and may be ignited by flame or spark shall comply with the applicable requirements of 527 CMR and the provisions of 527 CMR 10.16, and shall be maintained in accordance with NFPA 61, 65, 68, 69, 85F, 91, 490, 651, 653, 654, and 655 where provisions of 527 CMR 10.16 do not specifically cover conditions and operations.

(b) Permit required. A permit shall be obtained from the head of the fire department for the operation of any grain bleacher or elevator; flour, starch or feed mill; malt house; wood flour manufacturing plant; or plant pulverizing aluminum, coal, cocoa, magnesium, spices, sugar or other material producing dust as defined in 527 CMR 10.16(1)(a).

(2) Fire Safety Requirements Precautions. Smoking and the carrying of matches, the use of heating or other devices employing an open flame, or use of any spark producing equipment shall be prohibited in areas containing dust producing or dust agitating operations. Artificial lighting in such areas shall be by electricity with all wiring and electrical equipment installed in accordance with 527 CMR 12.00 (Massachusetts Electrical Code).

10.17: Places of Assembly

(1) General.

(a) Scope. The decoration, operation or use of places of assembly and education shall comply with the applicable requirements of 527 CMR 10.00 and 21.00 and 780 CMR.

(b) Permit required. A place of assembly or one for educational use shall not be maintained, operated or used as such without a Certificate of Inspection from the building code official.

(c) Posting of occupant load. Each place of assembly or education shall be posted with an approved legible sign in contrasting colors conspicuously located near the main exit from the room or space stating the number of occupants permitted within such space. The number of occupants permitted shall be determined by 780 CMR. Assembly rooms or spaces which have multiple use capability shall be posted for all such uses. The owner shall be responsible for installing and maintaining such signs.

10.17: continued

(d) Overcrowding. No person shall permit overcrowding or admittance of any person beyond the established posted occupant load of any place of assembly or education. The head of the fire department, upon finding overcrowded conditions or obstruction in aisles, passageways or other means of egress, or finding any condition which constitutes a hazard to life and safety shall cause the performance, presentation, spectacle or entertainment to be stopped until the area posted occupant load is re-established or the obstruction or hazardous condition is removed.

(2) Decorative Material. Decorative materials shall conform to 527 CMR 21.00 and 780 CMR.

(3) Motion Picture Screens. In places of assembly or education, a motion picture screen or screen masking shall not be used which will ignite and allow flame to spread over the surface when exposed to the test method test described in 527 CMR 21.00.

(4) Means of Egress.
(a) General. The operator or the person in charge of operation or use of any place of assembly or education shall check egress facilities before such building is occupied for any use, to determine compliance with the provisions of 527 CMR 10.17. If such inspection reveals that any element of the required means of egress is obstructed, inaccessible, locked, fastened or otherwise unsuited for immediate use, admittance to the building shall not be permitted until necessary corrective action has been completed.
(b) Doors. An egress door shall not be locked, bolted or otherwise fastened or obstructed by any means, so that the door cannot be opened from the inside by the use of the ordinary door latch or knob or by pressure on the door or on a panic release device except as provided in 780 CMR.
(c) Aisles. In each room where chairs, or tables and chairs, are used the arrangement shall be such as to provide for ready access by aisles to each egress door. Aisles leading directly to an egress door shall have not less than 44" clear width. When serving an occupant load of 50 or less, such required clear width shall not be less than 36". Aisles shall not be obstructed by chairs, tables or other objects.
(d) Obstructions. A part of a stairway, whether interior or exterior, or of a hallway, corridor, vestibule, balcony or bridge leading to a stairway or exit shall not be used in any way that will obstruct or restrict its use as a means of egress or that will present a hazardous condition.
(e) Signs and lighting. The signs and lighting of means of egress required for places of assembly or education shall be maintained in proper operating condition and be installed in accordance with 780 CMR.

(5) Projection Rooms.
(a) Refer to 780 CMR.
(b) Miscellaneous equipment: A maximum of four flammable liquid containers that do not have a capacity greater than 16 ounces and are of a nonbreakable type shall be permitted in each projection room.

10.18: Matches

(1) General.
(a) Scope. The storage or handling of matches in quantities as indicated herein shall comply with the applicable requirements of 527 CMR 10.00 and the provisions of 527 CMR 10.18.
(b) Permit required. A permit shall be obtained from the head of the fire department for the manufacture or storage of matches exceeding 25 cases in aggregate.

(2) Fire Safety Requirements.
(a) Wholesale storage. At wholesale establishments and wherever more than 25 cases of matches are stored, shipping containers containing matches shall be arranged in piles not exceeding 18' in height nor 25,000 cubic feet in volume. Such pile units shall be separated from each other and from other combustible material by a clear space of not less than four feet. Matches shall not be stored within ten feet of any exit, open stairway, elevator shaft opening or other vertical opening.

10.18: continued

(b) Smoking. Smoking shall be prohibited, except in approved designated areas.
(c) Retail storage. Where matches are sold at retail, original sealed containers shall not be stored closer than ten feet from heaters, furnaces, compressors or other mechanical equipment.
(d) Housekeeping. Where shipping containers containing matches are opened, the contents of the opened containers shall be removed and stored in metal or metal-lined bins equipped with self-closing covers.

10.19: Ovens and Furnaces

(1) Scope. 527 CMR 10.19 shall apply to all ovens and furnaces involving a fire or explosion hazard by reason of the temperatures at which the oven or furnace is operated; the fuel that is used; the presence of a flammable volatile from materials in the oven, furnace or combustion system; or a combination of the fuel and the flammable volatiles.

(2) Permit required. A permit shall be obtained from the head of the fire department to operate an oven or furnace to which 527 CMR 10.19 applies.

(3) Requirements.
(a) The appropriate standards are: NFPA 86, NFPA 86C, and NFPA 86D.
(b) Furnaces consisting of heated enclosures operating at approximately atmospheric pressure, which use a special processing atmosphere within the furnace, and vacuum furnaces, shall require approval.

10.20: Open Air Parking Spaces

Refer to M.G.L. c. 148, § 56.

10.21: Tire Rebuilding Plants

(1) General.
(a) Scope. Automobile tire rebuilding plants shall conform to all other applicable requirements of 527 CMR 10.00 as well as the following provisions.
(b) Permit required: A permit from the head of the fire department shall be required to conduct or maintain any tire recapping or rebuilding plant.

(2) Construction and Protection Requirements.
(a) Tire recapping and rebuilding plants shall have all floor openings, and vertical openings, such as for stairs and elevators, enclosed in accordance with the construction requirements of 780 CMR, and shall have fire doors at each floor.
(b) Tire recapping and rebuilding plants in buildings of wood frame construction or in buildings used in part for residence occupancy shall be separated from other parts of the building by wall or floor assemblies providing one-hour fire resistance installed in accordance with construction requirements of 780 CMR. Each opening into such room or compartments from other parts of the building shall be protected with an approved automatic self-closing fire door.
(c) Tire recapping and rebuilding plants shall conform to 780 CMR.

(3) Dust Collecting Systems. Buffing machines shall be located in a room separated from the remainder of the plant by wall or floor assemblies providing one-hour fire resistance in accordance with the construction requirements of 780 CMR. Each opening into such rooms or compartments from other parts of the building shall be protected with an approved automatic, self-closing fire door. Each machine shall be connected to an ample dust collecting system discharging to a suitable container which shall be cleaned at frequent intervals.. The dust collecting systems shall be constructed in accordance with the BOCA Mechanical Code.

(4) Ventilation. Each room where rubber cement is used or mixed, or flammable solvents are applied, shall be equipped with effective natural or mechanical ventilation for hazards installed in accordance with the BOCA Mechanical Code.

10.22: Open Air Fires

(1) No person shall set, maintain or increase a fire in the open air at any time except by permission, covering a period not exceeding two days from the date thereof, granted by the head of the fire department or forest warden. If such permission is not in writing, a written record shall be made setting forth the date upon which such permission was granted, the dates covered by such permission, the name and address of the person to whom, and the manner in which, such permit is granted, and any other information relative thereto. Such record shall be open to public inspection, reference (M.G.L. c. 48, § 13).

(2) Fire department training or research activities involving open air fires are permitted when specific approval is obtained from the Massachusetts Department of Environmental Protection.

(3) Persons 18 years of age or older may, without a permit, set, maintain or increase a reasonable fire for the purpose of cooking, upon sandy or gravelly land free from living or dead vegetation or upon sandy or rocky beaches bordering tidewater, if the fire is enclosed within rocks, metal or noncombustible material.

(4) When a permit for the purpose of burning debris resulting from the demolition of a building is issued, the authority granting such permit may make it a condition that sufficient fire department personnel, to be assigned at the expense of the person seeking such permit, shall be present at such burning to control the fire until it is entirely extinguished.

(5) Any permit granted under 527 CMR 10.22 may be revoked at any time. Whoever violates any provision of 527 CMR 10.22 shall be punished by a fine of not more than $100 or by imprisonment for not more than one month, or both. (Reference M.G.L. c. 48, § 13).

10.23: Bonfires and the Burning of Christmas Trees

(1) Ceremonial Bonfires. The city council of a city with the approval of its mayor, or the board of selectmen or town council of a town, may authorize the fire department of such city or town to issue not more than one permit in any one year for a ceremonial bonfire. Such bonfires shall mark the observance of a significant municipal, state or national event, and such ceremonial bonfire shall be under the continuous supervision of the fire department. A permit for such ceremonial bonfires shall be issued only to a municipal department or a civic, fraternal or veterans organization within such city or town. Only wood which has not been painted, impregnated, or otherwise treated with any foreign substance shall be permitted to burn in ceremonial bonfires. No bonfire shall burn for more than 12 hours. (Reference M.G.L. c. 111, § 142 H.)

10.23: continued

(2) Bonfires from July 2 to July 6: Any civic, fraternal, veteran, community or business organization may build and ignite bonfires under the supervision and control of the fire department of the city or town in which such burning takes place during the period from July 2 to July 6. A permit shall be obtained from the head of the fire department upon his determination that such organization will conduct such burning in a proper and reasonable manner. (Reference M.G.L. c. 111, § 142I.)

(3) Burning of Christmas Trees. Any person may burn Christmas trees during the period from December 26 to January 7, provided a permit is obtained from the head of the fire department where such burning shall take place and further provided that such burning is under the supervision and control of the fire department. (Reference M.G.L. c. 111, § 142G.)

10.24: Miscellaneous Provisions

(1) Any person having control of a mercantile, commercial or industrial establishment wherein canine guards are maintained shall notify the head of the fire department of the district, city or town within which such establishment is located that such canine guard is maintained therein. The head of the fire department and the person giving such notification shall cooperate in determining the procedure to be taken for the safety of authorized persons entering such mercantile, commercial or industrial establishment.

(2) Any person using a torch or other flame or heat producing device for the removal of paint or the application or removal of roofing material from any building or structure shall provide one approved fire extinguisher or water hose connected to an adequate water supply on the property where such burning is done. In all cases, the person doing the work shall remain on the premises for one hour after each use of the torch or other flame or heat producing device. A permit shall be obtained from the head of the fire department prior to the use of a torch or other flame or heat producing device.

10.25: Bulk Merchandising Retail Buildings

(1) Storage arrangement, including: commodity clearances, piling procedures, aisle widths and access, rack loading, and flue space openings, shall be maintained in accordance with the applicable section(s) of NFPA 30, 30B, 231, 231C, 231D and 430. Random variation in the width of a flue space opening or in their vertical alignment is permitted, provided the configuration does not obstruct water penetration.

(2) All commodities shall be stable to prevent collapse in case of a fire.

(3) During stocking operations, a minimum unobstructed aisle width of 44 inches (111.76 cm) shall be maintained. Good housekeeping shall be maintained at all times.

(4) Smoking shall be strictly prohibited, except in locations prominently designated as smoking areas. Such areas shall be approved by the head of the fire department. "No Smoking" signs shall be conspicuously posted in all prohibited areas.

(5) Portable fire extinguishers shall be provided and installed in accordance with NFPA 10. Extinguisher selection shall include a review of the fire hazards anticipated; for example, only water-type extinguishers shall be located in areas where chlorine-containing oxidizers are stored or displayed.

(6) Power-operated industrial trucks shall be of the type designated in NFPA 505.

10.25: continued

(7) An "Evacuation Plan" shall be submitted to the head of the fire department and an approved copy shall be kept on the premises. The plan shall be used to ensure the safe evacuation of all customers and employees. The plan shall detail procedures, define roles and responsibilities of employees, and include an egress plan indicating routes of travel to all exits. All employees shall be instructed and periodically trained with respect to their duties.

(8) A "Firesafety Plan" describing fire and life safety conditions for the property shall be made available for review by inspection authorities upon request, and it will be the responsibility of the owner/operator of the property to maintain an up-to-date copy of the plan on-site. The plan shall include both narrative and graphical information in a clear, concise format; shall be prepared by a competent, qualified individual; and, shall be subject to the approval of the head of the fire department. The plan shall include, but not be limited to, the following:

(a) Property Identification
(b) Operation and Use
(c) Construction Features
(d) Means of Egress
(e) Common Hazards
(f) Special Hazards
(g) Water Supply
(h) Extinguishing Systems and Devices
(i) Evacuation Notification and Alarm Systems
(j) Fire Prevention Policies and Procedures
(k) Exterior Exposures
(l) Fire Department Access

10.26: Covered Mall Buildings

A permit from the head of the fire department shall be required for facilities that utilize the mall area for trade shows, exhibits or displays. Exhibits and displays shall include, but are not limited to, the following; community service projects, sidewalk sales, holiday sales, and special seasonal events.

10.27: Cellulose Nitrate Film

(1) Storage and handling of cellulose nitrate film shall be in accordance with NFPA 40.

(2) A permit shall be obtained from the head of the fire department for the storage, handling, or use of celulose nitrate film.

10.28: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 10.00 shall be considered a part of the requirements of 527 CMR 10.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 10.00: M.G.L. c. 148, § 28.

527 CMR 11.00: COMMERCIAL COOKING OPERATIONS

Section

11.01: Scope and Purpose
11.02: Adoption by Reference
11.03: Modifications of Provisions of NFPA 96

11.01: Scope and Purpose

The scope of 527 CMR 11.00 is to provide minimum fire safety requirements (preventive and operative) related to the design, installation, operation, inspection, and maintenance of all public and private cooking operations.

The purpose of 527 CMR 11.00 shall be to reduce the potential fire hazard of cooking operations, irrespective of the type of cooking equipment used and whether used in public or private facilities.

11.02: Adoption by Reference

For the requirements of 527 CMR 11.00, the provisions of NFPA No. 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,* 2004 Edition, are incorporated by reference except for the modifications stated in 527 CMR 11.03

11.03: Modification of Provisions of NFPA 96

For the purpose of 527 CMR 11.00, the provisions of NFPA 96 shall be modified as follows:

(1) Section 2-1 Definitions: The definition of Authority Having Jurisdiction shall be revised to read:

Authority Having Jurisdiction: The head of the fire Department.

REGULATORY AUTHORITY

527 CMR 11.00: MGL c. 148, §§ 9, 10 and 28.

NON-TEXT PAGE

527 CMR 12.00: 2008 MASSACHUSETTS ELECTRICAL CODE (AMENDMENTS)

The 2008 Massachusetts Electrical Code (527 CMR 12.00) of the Board of Fire Prevention Regulations shall be the 2008 National Electrical Code (NFPA-70) modified as follows:

Insert the following provisions ahead of the body of the Code:

Rule 1. All installations, repairs and maintenance of electrical wiring and electrical fixtures used for light, heat, power, signaling and communications purposes in buildings and structures subject to the provisions of M.G.L. c. 143 shall be reasonably safe to persons and property.

Rule 2. Conformity of installations, repairs, and maintenance of electrical wiring and electrical fixtures used for light, heat, power, signaling and communications with applicable regulations set forth in the Code, which is hereby filed with the Secretary of the Commonwealth shall be considered as complying with these requirements.

Rule 3. Additions or modifications to an existing installation shall be made in accordance with this Code without bringing the remaining part of the installation into compliance with the requirements of this Code. The installation shall not create a violation of this Code, nor shall it increase the magnitude of an existing violation.

Rule 4. Where an actual hazard exists, the owner of the property shall be notified in writing by the authority enforcing this Code. The notification shall contain specifications of the actual hazard that exists, together with a reference to the rule of this Code that is now in violation. (*See* M.G.L. c. 166, §§ 32 and 33, for enforcement authority.)

Rule 5. References are made in this code to other standards. Those standards, where duly adopted by law or regulation, may be enforced by the appropriate official. They are not considered part of this Code and they are not enforceable under M.G.L. c. 143, § 3L. For Massachusetts Building Code references, *see* Appendix A.

Rule 6. The approving authority may be guided in his approval of specific items of equipment and materials contemplated by the Code, by proof that such equipment and materials have been tested and conform to suitable recognized industry standards.

Rule 7. 527 CMR 12.00 shall be effective on all installations for which a permit has been granted subsequent to December 31, 2007.

Rule 8. In accordance with the provisions of M.G.L. c. 143, § 3L, the permit application form to provide notice of installation of wiring shall be uniform throughout the Commonwealth, and applications shall be filed on the prescribed form. After a permit application has been accepted by an Inspector of Wires appointed pursuant to M.G.L c. 166, §32, an electrical permit shall be issued to the person, firm or corporation stated on the permit application. Such entity shall be responsible for the notification of completion of the work as required in M.G.L. c. 143, § 3L.

Permits shall be limited as to the time of ongoing construction activity, and may be deemed by the Inspector of Wires abandoned and invalid if he or she has determined that the authorized work has not commenced or has not progressed during the preceding 12-month period. Upon written application, an extension of time for completion of work shall be permitted for reasonable cause. A permit shall be terminated upon the written request of either the owner or the installing entity stated on the permit application.

Rule 9. Installations covered by 527 CMR 12.00 shall also comply with M.G.L. c. 141.

Rule 10. Electrical installations shall not be concealed or covered from view until inspected by the inspector of wires within and not more than 24 hours for exterior excavations nor more than 72 hours for interior installations after proper notice to the inspector, Saturdays, Sundays, and holidays excluded.

12.00: continued

90.2(B)(5)(b). Revise to read as follows:

> (b) Are located in legally established easements, rights-of-way, or by other agreements either designated by or recognized by the public service commissions, utility commissions, or other regulatory agencies having jurisdiction for such installations.

90.4. Revise the first paragraph to read as follows:

> 90.4 Enforcement. This Code shall be used by the authority enforcing the Code and exercising legal jurisdiction over electrical installations. The authority having jurisdiction of enforcement of the Code shall accept listed and labeled equipment or materials where used or installed in accordance with instructions included with the listing or labeling. The authority shall have the responsibility for deciding upon the approval of unlisted or unlabeled equipment and materials, and for granting the special permission contemplated in a number of the rules.

90.6. Revise to read as follows:

> 90.6 Interpretations and Appeals. To promote uniformity of interpretation and application of the provisions of this Code, interpretations may be requested from the Board of Fire Prevention Regulations. Requests for interpretation shall be in the form of a question that can receive a "Yes" or "No" answer. This in no way supersedes the right of any individual who is aggrieved by the decision of an Inspector of Wires to appeal from that decision to the Board of Electricians' Appeals in accordance with M.G.L. c. 143, § 3P. The Board of Fire Prevention Regulations shall, upon the request of the Board of Electricians' Appeals, render interpretations to the Board of Electricians' Appeals.
>
> It is customary to revise this Code periodically to conform with developments in the art and the result of experience, and the current edition of the Code shall always be used.

90.10. Add new section numbered 90.10 to read:

> 90.10. References to Commonwealth of Massachusetts Codes, Regulations, and Laws. References are included in Appendix A for Building Codes, Elevator Regulations, Plumbing and Fuel Gas Code, Board of Fire Prevention Regulations, Division of Industrial Safety, State Sanitary Code, Architectural Barriers Regulations, Permit Applications, and Chapters of the General Laws. *See* Appendix A.

Article 100, Structure. Revise the definition to read as follows:

> A combination of materials assembled or located at a fixed location to give support or shelter.

110.14(A). Delete the last sentence of the first paragraph and insert the following two sentences in its place:

> Connection by means of wire binding screws or studs and nuts having upturned lugs or equivalent shall be permitted for 10 AWG or smaller solid conductors. Where stranded conductors are terminated on and not looped through such terminals, the terminals shall be identified for such use, or the strands at the terminals shall be made solid.

110.26(A)(1). Add a fourth paragraph (d) as follows:

> (d) Adequate Accessibility. By special permission, smaller spaces may be permitted where it is judged that the particular arrangement of the installation will provide adequate accessibility.

200.7(C)(2). Revise the last sentence to read as follows:

> In these applications reidentification of the conductor with white or gray insulation or with three continuous white stripes shall not be required.

12.00: continued

210.25(B). Add an exception as follows:

> Exception: Branch circuits supplying lighting outlets in common areas on the same floor as a dwelling unit in a new or existing two-family or an existing three-family building shall be permitted to be supplied from equipment that supplies one or more of those dwelling units.

210.52(E). Revise this material to read as follows:

> (E) Outdoor Outlets. Outdoor receptacle outlets shall be installed in accordance with (E)(1) through (E)(3). [*See* 210.8(A)(3).]
>
> (1) One-family and Two-family Dwellings. For a one-family dwelling and each unit of a two-family dwelling that is at grade level, at least one receptacle outlet readily accessible from grade and not more than 2.0 m (6½ feet) above grade level shall be installed at the front and back of the dwelling.
>
> (2) Multifamily Dwellings. For each dwelling unit of a multifamily dwelling where the dwelling unit is located at grade level and provided with individual exterior entrance/egress, at least one receptacle outlet readily accessible from grade and not more than 2.0 m (6½ feet) above grade level shall be installed.
>
> (3) Balconies, Decks and Porches. Balconies, decks and porches that are attached to the dwelling unit and are accessible from inside the dwelling shall have at least one receptacle outlet installed accessible from the balcony, deck or porch. The receptacle shall not be located more than 2.0 m (6 ½ ft) above the balcony, deck, or porch surface.
>
> Exception to (3): Balconies, decks, or porches with a usable area of less than 1.86 m^2 (20 ft^2) are not required to have a receptacle installed.

210.70(D). Insert an additional lettered subsection (D) to 210.70 as follows:

> (D) GFCI Protection of Lighting Outlets in All Occupancies. The operation of a single GFCI device shall not deenergize all lighting outlets in a given area.

220.12. Revise the listed items in Table 220.12 as follows:

	Unit Load	
Type of Occupancy	Volt-Amperes per Square Meter	Volt-Amperes per Square Foot
Banks	28[b] (reduced from 39)	2½[b] (reduced from 3½)
Garages—commercial (storage)	3 (reduced from 6)	¼ (reduced from ½)
Office Buildings	33[b] (reduced from 39)	3[b] (reduced from 3½)
Warehouses (storage)	6 (increased from 3)	½ (increased from ¼)

225.30(E). Revise to read as follows:

> (E) Documented Switching Procedures. Additional feeders or branch circuits shall be permitted to supply large capacity multibuilding industrial or institutional installations under single management where documented safe switching procedures are established and maintained for disconnection.

225.32 Exception No. 1. Revise to read as follows:

> Exception No. 1: For large capacity multibuilding industrial or institutional installations under single management where documented safe switching procedures are established and maintained for disconnection, and where the disconnection is monitored by qualified individuals, the disconnecting means shall be permitted to be located elsewhere on the premises.

12.00: continued

230.40. Amend Exception No. 1 to read:

> Exception No. 1: By special permission, where there is no available space for service equipment accessible to all the occupants, buildings with more than one occupancy shall be permitted to have one set of service entrance conductors run to each occupancy or to a group of occupancies.

230.70(A)(1). Add the following sentence at the end of this paragraph:

> Where the location of the service disconnecting means is outside of and not attached or adjacent to the building or structure served, a feeder disconnect shall be installed either inside or outside of the building or structure in compliance with the provisions of 225.32.

230.82. Revise this section to read as follows:

> 230.82. Equipment Connected to the Supply Side of Service Disconnect. Only equipment included in this section shall be permitted to be connected to the supply side of the service disconnecting means.
>
> (A) Unswitched Equipment.
> (1) Cable limiters or other current limiting devices
> (2) Meters or meter sockets nominally rated not in excess of 600 volts, provided all metal housings and service enclosures are grounded in accordance with Part VII and bonded in accordance with Part V of Article 250.
> (3) Instrument transformers (current and voltage), high-impedance shunts, load management devices, surge arresters, and Type 1 surge-protective devices
> (4) Taps used only to supply load management devices, circuits for standby power systems, fire pump equipment, and fire and sprinkler alarms, if provided with service equipment and installed in accordance with requirements for service-entrance conductors
> (5) Solar photovoltaic systems, fuel cell systems, or interconnected electric power production sources
> (6) Control circuits for power-operable service disconnecting means, if suitable overcurrent protection and disconnecting means are provided
> (7) Ground-fault protection systems or Type 2 surge protective devices, where installed as part of listed equipment, if suitable overcurrent protection and disconnecting means are provided
>
> (B) Meter Disconnect Switches. A disconnecting means shall be permitted to be located ahead of the service equipment provided the installation complies with 230.82(B)(1) through 230.82(B)(3). A separate service disconnecting means that complies with Part V of Article 230 shall be installed, and shall be located as provided in 230.70(A)(1).
> (1) Rating. A meter disconnect shall be capable of interrupting the load served. It shall have a short-circuit current rating not less than the available short-circuit current.
> (2) Marking. A meter disconnect shall be legibly field marked on its exterior in a manner suitable for the environment substantially as follows:
>
> METER DISCONNECT
> NOT SERVICE EQUIPMENT
>
> (3) Grounding. A meter disconnect shall be groundedin accordance with Part VII and bonded in accordance with Part V of Article 250. The grounding connections shall be permitted to be in accordance with 250.142(A)(1).

250.32(A). Revise the Exception to read as follows:

> Exception: A grounding electrode at a separate building or structure shall not be required where no branch circuits originate at that building or structure. The branch circuit(s) shall include an equipment grounding conductor for grounding the noncurrent-carrying parts of all equipment.

12.00: continued

250.52(A)(3). Add a fine print note as follows:

> FPN: These electrodes, where available due to the footings not yet having been poured, are usually far lower in impedance than rod, pipe, or plate electrodes.

250.119 Exception. Revise to read as follows:

> Exception: Where equipment is connected by a multiconductor cable and is not required to be grounded in accordance with 250.112(1), the color green shall be permitted to be used for other than grounding conductors.

250.130(C). Delete this subsection.

300.4(D). Delete this subsection.

300.4(E). Delete the exception and revise the rule and fine print note to read as follows:

> (E) Cables and Raceways Installed Under Roof Decking. A cable- or raceway-type wiring method, installed in exposed or concealed locations below metal-corrugated sheet roof decking, shall be installed and supported so the upper outside surface of the cable or raceway is not less than 38 mm (1½ inches) below the lowest surface of the roof decking.
>
> FPN: Roof decking material is often repaired or replaced after the initial raceway or cabling and roofing installation and may be penetrated by the screws or other mechanical devices designed to provide "hold down" strength of the water-proof membrane or roof insulating material. Where the deck is of corrugated construction, the length of the holding screws is usually chosen to penetrate the lowest level of any corrugation as measured from the upper roof surface.

300.5(A). Add a fine print note to this subsection as follows:

> FPN: Cables suitable for direct burial are often sleeved in various raceways for design reasons. If such cable is installed with sufficient cover for direct burial, then the characteristics of that raceway need not be evaluated. Other rules of this Code that apply to raceways generally may apply. *See* 300.5(H).

300.11(A). Revise this subsection as follows:

> I. Delete the third sentence in 300.11(A) which reads: "Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support."
>
> II. Revise 300.11(A)(2) to read as follows:
>
> (2) Nonfire-rated Assemblies. Branch-circuit wiring associated with equipment that is located within, supported by, or secured to a suspended ceiling that is not an integral portion of a fire-rated floor/ceiling or roof/ceiling assembly shall be permitted to be supported by the ceiling support wires.
>
> III. Delete 300.11(A)(2) Exception.

300.17. Add a second paragraph as follows:

> Where different raceway wiring methods are joined together without a pull point at the transition, there shall not be more than the equivalent of four quarter bends (360° total) between pull points, *e.g.*, conduit bodies and boxes.

300.37. Insert the following sentence following the first sentence:

> Where rigid nonmetallic conduit is used, it shall be Schedule 80 or it shall be suitably encased in not less than 50 mm (two inches) of concrete.

300.50. In Note 3 to Table 300.50, insert the words "or institutional" after the word "industrial".

310.15(B)(2)(a). Revise Table 310.15(B)(2)(a) to read as follows:

Number of Current-Carrying Conductors	Percent of Values in Tables 310.16 through 310.19, as Adjusted for Ambient Temperature if Necessary
4 through 6	80
7 through 24	70
25 through 42	60
43 and above	50

FPN: Overheating may occur where continuous, fully loaded conductor diversity is less than 50% and the number of current-carrying conductors exceeds nine. *See* 310.10.

310.15(B)(2)(a). Delete Exception No. 5:

320.80(A). Delete the last sentence, which reads: "The 90°C (194°F) rating shall be permitted to be used for ampacity derating purposes, provided the final derated ampacity does not exceed that for a 60°C (140°F) rated conductor."

334.10. Insert two exceptions after (3) to read as follows:

Exception No. 1 to (2) and (3): For buildings or structures required to be of Type I or Type II construction, Type NM, Type NMC, and Type NMS cables shall be permitted to be used, provided that where so applied in buildings or structures exceeding three stories above grade, circuits run in Type NM, NMC, or NMS cable shall not leave the floor or dwelling unit from which the circuits originate.

Exception No. 2 to (3): For detached buildings that are accessory structures to dwelling occupancies, Type NM, Type NMC, and Type NMS cables shall be permitted to be used without concealment.

334.12(A)(2). Revise to read as follows:

(2) In dropped or suspended ceilings in other than one- and two-family and multifamily dwellings, unless run so as to closely follow the surface of framing members, running boards, or the equivalent, or unless connected to luminaires or other pieces of electrical equipment in accordance with 334.30(B)(2).

334.17. Revise to read as follows:

334.17 Through or Parallel to Framing Members and Furring Strips. Types NM, NMC, or NMS cable shall comply with 300.4 where installed through studs, joists, rafters, and similar members. Grommets or bushings shall be used in metal studs as required in 300.4(B)(1), shall remain in place during the wall finishing process, shall cover the complete opening, and shall be listed for the purpose of cable protection.

In both exposed and concealed locations, where the cable is installed parallel to framing members, such as joists, rafters, or studs, or is installed parallel to furring strips, the cable shall be secured so that the nearest outside surface of the cable is not less than 19 mm (¾ inch) from the nearest edge of the framing member or furring strip where nails or screws are likely to penetrate. Where this distance cannot be maintained, the cable shall be protected from penetration by nails or screws by a steel plate, sleeve, or equivalent at least 1.6 mm ($^1/_{16}$ inch) thick. A listed and marked steel plate less than 1.6 mm ($^1/_{16}$ inch) thick that provides equal or better protection against nail or screw penetration shall be permitted for this purpose.

Exception: For concealed work in finished buildings, or finished panels for prefabricated buildings where such supporting is impracticable, it shall be permitted to fish the cable between access points.

12.00: continued

334.30. Revise 334.30 as follows [(A), (B), and (C) unchanged from the NEC]:

> 334.30 Securing and Supporting. Nonmetallic-sheathed cable shall be secured by staples, cable ties, straps, or similar fittings so designed and installed as to not damage the cable. Where staples are used for cable sizes smaller than three 8 AWG conductors, they shall be of the insulated type, or listed noninsulated staples driven by staple guns shall be permitted. Cable shall be secured in place at intervals not exceeding 1.4 m (4½ feet) and within 300 mm (12 inches) from every cabinet, box, or fitting. Where the cable is run diagonally behind strapping of a nominal 19 mm (¾-inch) thickness it shall be considered supported, secured, and in compliance with 334.17 where it is not pulled taut. For other than within 300 mm (12 inches) of a cable termination at a cabinet, box, or fitting, cables passing through successive holes in adjacent framing members no more than 600 mm (24 inches) apart shall be considered to be secured.
>
> Sections of cable protected from physical damage by raceway shall not be required to be secured within the raceway.

334.80. Delete the second paragraph and revise the first paragraph to read as follows:

> 334.80 Ampacity. Type NM, NMC, and NMS cable shall have conductors rated at 90°C (194°F). Where installed in thermal insulation, the ampacity of conductors shall be that of 60°C (140°F) conductors. The ampacity of Types NM, NMC, and NMS cable installed in cable tray shall be determined in accordance with 392.11.

338.10(B)(4)(a). Identify the existing fine print note as FPN No. 1, and add a second fine print note as follows:

> FPN No. 2: This section includes service entrance cables with a round configuration commonly known as SER cable. The interior installation of this cable is governed by the same rules as apply to nonmetallic sheathed cable.

342.30(C). Delete this provision. Also, delete the clause "or permitted to be unsupported in accordance with 342.30(C)" from the last sentence of 342.30.

344.6. Add an exception as follows:

> Exception: Rigid metal conduit made from stainless steel or from nonferrous metals other than aluminum shall be permitted to be approved.

344.30(C). Delete this provision. Also, delete the clause "or permitted to be unsupported in accordance with 344.30(C)" from the last sentence of 344.30.

352.12. Add a new (G) to read as follows:

> (G) High-rise Buildings. Where used in buildings more than 21 m (70 feet) above mean grade, rigid nonmetallic conduit shall not be used unless the building is protected by an approved fire sprinkler system(s) installed on all floors as a complete system, or the conduit is concealed behind a thermal barrier as described in 362.10(2) or 362.10(5), or the conduit is encased in not less than 50 mm (2 inches) of concrete.

352.30(C). Delete this provision. Also, delete the clause "or permitted to be unsupported in accordance with 352.30(C)" from the last sentence of 352.30.

352.44. Revise to read as follows:

> 352.44 Expansion Fittings. Expansion fittings for rigid nonmetallic conduit shall be provided to compensate for thermal expansion and contraction where the length change will exceed, in accordance with Tables 352.44(A) and (B), 3 mm ($^1/_8$ inch) at securely mounted items such as boxes, cabinets, elbows, or other conduit terminations.

12.00: continued

355.30(C). Delete this provision. Also, delete the clause "or permitted to be unsupported in accordance with 355.30(C)" from the last sentence of 355.30.

358.30(C). Delete this provision. Also, delete the clause "or permitted to be unsupported in accordance with 358.30(C)" from the last sentence of 358.30.

368.8. Insert a new Section 368.8 in Part I of Article 368 as follows:

> 368.8 Tests Prior to Energizing. Busway system joint tightness and joint resistance, phasing, and insulation resistance shall be verified by test prior to energizing the system for the first time. A written record of these tests shall be made available to the authority having jurisdiction.

368.14. Insert a new Section 368.14 in Part II of Article 368 as follows:

> 368.14 Protection from Liquids, Moisture and Other Contaminants. Busway shall be protected from liquids, moisture, and other contaminants or corrosion that may result in electrical failure.
>
> (A) During Construction. Indoor busways shall be protected from moisture during storage as well as during or after installation. Special consideration shall be given to riser busways to protect them from moisture from uncompleted roofs, walls, *etc.*
>
> Outdoor busways shall be treated the same as indoor busways until after busway is properly installed, as it is not weather resistant until completely and properly installed.
>
> Busway shall have the exposed ends of uncompleted runs protected to prevent accidental contamination during the construction period.
>
> (B) Protection from Snow Buildup. Outdoor busway shall be mounted in such a manner as to prevent snow or ice buildup forcing water into the busway through weep holes. This may require that consideration be given to horizontal snow or ice buildup or drifting of snow.
>
> (C) Protection from Falling Liquids. Slant shields, drip pans, or other approved protective shields shall be installed to protect indoor busway in locations where there is a possibility of water spillage or dripping condensate from roof drains, water pipes, and the like.

368.56(B). Revise the rule in list item (2) and the exception to (B)(2) to read as follows:

> (2) The length of the cord or cable from a busway plug-in device to a suitable tension take-up support device shall not exceed 2.5 m (8 feet).
>
> Exception to (B)(2): By special permission in industrial establishments only, where the conditions of maintenance and supervision ensure that only qualified persons will service the installation, flexible cord suitable for hard usage or extra hard usage or bus drop cable shall be permitted to extend horizontally greater lengths than 2.5 m (8 feet) where the longer length is essential for periodic repositioning of equipment. The flexible cord or bus drop cable shall be supported at intervals not to exceed 2.5 m (8 feet), and suitable tension take-up device(s) shall be installed at the end of the horizontal run to relieve strain in both the horizontal and vertical directions.

372.17. Revise this section to read as follows:

> 372.17 Ampacity of Conductors. The ampacity adjustment factors in 310.15(B)(2)(a) shall not apply where 30 or fewer current-carrying conductors occupy no more than 20 percent of the interior cross-sectional area of cellular concrete floor raceways.

374.17. Revise this section to read as follows:

> 374.17 Ampacity of Conductors. The ampacity adjustment factors in 310.15(B)(2)(a) shall not apply where 30 or fewer current-carrying conductors occupy no more than 20 percent of the interior cross-sectional area of cellular metal floor raceways.

12.00: continued

390.17. Revise this section to read as follows:

390.17 Ampacity of Conductors. The ampacity adjustment factors in 310.15(B)(2)(a) shall not apply where 30 or fewer current-carrying conductors occupy no more than 20 percent of the interior cross-sectional area of underfloor raceways.

400.5. Revise the table following the first paragraph to read as follows:

Number of Current-Carrying Conductors	Percent of Values in Tables 400-5A and 400-5B
4 through 6	80
7 through 24	70
25 through 42	60
43 and above	50

FPN: Overheating may occur where continuous, fully loaded conductor diversity is less than 50% and the number of current-carrying conductors exceeds nine. *See* 310.10.

400.8(4). Revise the existing exception as follows:

Exception to (4): Flexible cord and cable shall be permitted to be installed in accordance with 368.8(B). For other applications, where the length of the cord from the supply termination to a suitable tension take-up device is limited to 2.5 m (8 feet), flexible cord shall be permitted to have one connection to the building surface.

400.14. Revise the second paragraph to read as follows:

Flexible cords and cables shall be permitted to be installed in raceways not longer than 15 m (50 feet) in length where required to protect the flexible cord or cable from physical damage. The ampacity of the conductors within a raceway shall be adjusted in accordance with Table 400.5 based on the total number of current-carrying conductors within the raceway, and then further derated by a factor of 0.8, or the ampacity shall be calculated in accordance with 310.15(C). The raceway shall be exposed over its entire length.

410.36(B). Add a second paragraph as follows:

In addition to, or in *lieu* of, the mechanical fastening means, electric luminaires containing ballasts, other than simple fluorescent reactance ballasts, shall be supported directly to the building structure by wire, chain, or threaded rod of sufficient strength to carry the luminaire. Fluorescent luminaires shall be supported at each end of a diagonal axis of the luminaire.

511.12. Revise and add an exception as follows:

511.12. Ground-fault Circuit-interrupter for Personnel. All 125-volt single-phase 15- and 20-ampere receptacles installed in areas where electrical diagnostic equipment, electrical hand tools, portable lighting equipment, or portable appliances are to be used shall have ground-fault circuit-interrupter protection for personnel.

Exception: Where an individual branch circuit supplies a single receptacle that is located and identified for the specific use of computerized diagnostic equipment, it shall be permitted to omit the ground-fault circuit-interrupter protection for personnel.

517.13(B). Delete Exception No. 2.

12.00: continued

680.7. Insert a fine print note ahead of 680.7(A) as follows:

> FPN: Unlisted swimming pool pump motors have been observed in the field as having been supplied by their manufacturer with undersized cords, cords of excessive length, cord connectors on outdoor applications that are unsuitable for wet locations, and other violations of this Code. The fact that a manufacturer may supply them in this form does not excuse compliance with the rules of this Code.
>
> Listed storable swimming pool pump motors with long factory-supplied cords are prominently marked as such and are not covered in Part II of Article 680. They are not manufactured for use with permanently installed pools and they need not be bonded where used as intended. *See* 680.31.

680.26(C). Revise to read as follows:

> (C) Pool Water. Pool water shall have an electrical connection to one or more of the bonded parts described in 680.26(B). Where none of the bonded parts is in direct connection with the pool water, the pool water shall be in direct contact with an approved corrosion-resistant conductive surface that exposes not less than 5800 mm^2 (9 inches^2) of surface area to the pool water at all times. The conductive surface shall be located where it is not exposed to physical damage or dislodgement during usual pool activities, and it shall be bonded in accordance with 680.26(B).

680.73. Add the following sentence to 680.73 at the end: "Where the hydromassage bathtub is cord- and plug-connected with the supply receptacle accessible only through a service access opening, the receptacle shall be installed so that its face is within direct view and not more than 300 mm (one foot) of the opening."

682.14. Revise to read as follows:

> 682.14 Submersible or Floating Equipment Power Connection(s). Submersible or floating equipment shall be cord- and plug-connected, using extra hard usage cord, as designated in Table 400.4 and listed with a "W" suffix. The plug and receptacle combination shall be arranged to be suitable for the location while in use. Disconnecting means shall be provided to isolate each submersible or floating electrical equipment from its supply connection(s) without requiring the plug to be removed from the receptacle.
>
> Exception: Equipment listed for direct connection and equipment anchored in place and incapable of routine movement caused by water currents or wind shall be permitted to be connected using wiring methods covered in 682.13.
>
> (A) Type and Marking. The disconnecting means shall consist of a circuit breaker, switch, or both, or molded case switch, and shall be specifically marked to designate which receptacle or other outlet it controls.
>
> (B) Location. The disconnecting means shall be readily accessible on land, located not more than 750 mm (30 inches) from the receptacle it controls, and shall be located in the supply circuit ahead of the receptacle. The disconnecting means shall be located within sight but not closer than 1.5 m (5 feet) from the shoreline. Uninsulated live parts shall be elevated not less than 300 mm (12 inches) above the datum plane.

695.3. Insert a fine print note ahead of 695.3(A) as follows:

> FPN: NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, provides information on the characteristics of reliable power sources in Appendix A, item A-6.2.3.

700-9(D). Revise to read as follows:

> (D) Fire Separation: Emergency system feeders, wiring to elevator machine rooms including the cab lighting disconnecting means, and wiring to fire pumps shall comply with 700.9(D)(1) and (2).

12.00: continued

(1) Equipment. All required emergency systems generation and distribution equipment shall be located in two-hour fire resistive rated rooms, closets or shafts. Equipment, conduit, piping, or ductwork alien to the emergency system shall not be located within these rooms, closets, or shafts.

Exception No. 1: Equipment for feeder circuits (including transfer switches, transformers, panelboards, *etc.*) for legally required standby purposes in compliance with the provisions of Article 701, or for the equipment system of a hospital as covered in 517.30(B)(3) and 517.34, or for the critical branch of a nursing home as covered in 517.43, shall be permitted in the same room. Nonemergency equipment shall be installed sufficiently remote from emergency equipment that a failure within one will be unlikely to damage the other.

Exception No. 2: Distribution equipment supplying only branch circuits covered by the provisions of Part VII of Article 517 shall be permitted in other spaces.

(2) Wiring. All portions of emergency system feeders located outside of rooms, closets, or shafts required by 700.9(D)(1) shall be enclosed within two-hour fire resistive rated enclosures or be part of an assembly that has a two-hour fire resistive rating.

FPN: Available methods for achieving the required fire resistance rating may include electric circuit protective systems, thermal barrier systems for electrical system components, listed fire-rated assemblies, and cables listed to maintain circuit integrity where installed in accordance with applicable listing requirements. Further details may be found in directories of fire resistance published by qualified testing laboratories.

Exception to 700.9(D)(1) and (2): In buildings or structures less than 21 m (70 feet) in height, or for new emergency feeders or equipment in existing buildings, alternative methods of protection may be accepted by the authority having jurisdiction where it is assured that equivalent objectives can be achieved.

FPN: Many techniques intended to prevent the deflection of steel members at high temperatures will not materially increase the survival time of circuits in electric raceways.

700.12. Add an exception after the first paragraph as follows:

Exception: A fire pump shall be permitted to use a connection ahead of the service disconnecting means in accordance with 695.3(A)(1).

700.12 Revise the fourth paragraph to read as follows:

Equipment for sources of power as described in 700.12(A) through 700.12(E) shall comply with 700.9(D)(1) of this Code where circuit(s) covered in 700.9(D) are supplied.

700.12(F). Delete the second sentence of the second paragraph that reads:

Flexible cord- and plug-connection shall be permitted provided that the cord does not exceed 900 mm (3 feet) in length.

700.27. Designate the existing exception as Exception No. 1 and add a second exception and fine print note to read as follows:

Exception No. 2: Where the emergency system design is under the control of a licensed professional engineer engaged in the design or maintenance of electrical installations, the selection of overcurrent protective devices shall be permitted to coordinate to the extent practicable. The design shall be documented, stamped by the professional engineer, and made available for review by the authority having jurisdiction.

FPN: Overcurrent protective devices used for emergency circuit protection, where coordinated to optimize selective operation of the circuit overcurrent protective devices when a short circuit or ground fault occurs, increase overall reliability of the system.

12.00: continued

701.11(G). Delete the second sentence of the second paragraph which reads:

> Flexible cord- and plug-connection shall be permitted provided that the cord does not exceed 900 mm (3 feet) in length.

701.18. Designate the existing exception as Exception No. 1 and add a second exception and fine print note to read as follows:

> Exception No. 2: Where the legally required standby system design is under the control of a licensed professional engineer engaged in the design or maintenance of electrical installations, the selection of overcurrent protective devices shall be permitted to coordinate to the extent practicable. The design shall be documented, stamped by the professional engineer, and made available for review by the authority having jurisdiction.
>
> FPN: Overcurrent protective devices used for legally required standby circuit protection, where coordinated to optimize selective operation of the circuit overcurrent protective devices when a short circuit or ground fault occurs, increase overall reliability of the system.

708.54. Add the following exception and fine print note:

> Exception: Where the critical operations power system design is under the control of a licensed professional engineer engaged in the design or maintenance of electrical installations, the selection of overcurrent protective devices shall be permitted to coordinate to the extent practicable. The design shall be documented, stamped by the professional engineer, and made available for review by the authority having jurisdiction.
>
> FPN: Overcurrent protective devices used for critical operations power systems, where coordinated to optimize selective operation of the circuit overcurrent protective devices when a short circuit or ground fault occurs, increase overall reliability of the system.

APPENDIX A†

780 CMR: MASSACHUSETTS STATE BUILDING CODE

(6th Edition with changes and corrections up to November 27, 1998)

High rise buildings	403.0 complete
Smoke Control (atrium)	404.4
Fire Alarm (in all buildings with atrium)	404.6
Underground structures	405.0 complete
Use Group I-2 Smoke/heat detection	409.5.1
Use group I-3 Remote release of locks on doors – egress	410.4.1 through 410.4.5
Lighting control (theaters)	411.4
Footlights and stage electrical equipment	412.3.3
Automatic fire detection systems (airport traffic control towers)	414.4
Standby power, light, and emergency systems (airport traffic control towers)	414.5
HPM Use facilities (Hazardous Production Materials)	416.0 complete
Hazardous Materials	417 complete
Swimming pools, alarmed access, where required	421.10.1.9
Group residence (fire warning system)	423.7.2
Child day care centers	424.0 complete
Limited group residence (Fire Alarm)	427.3.6 – 427.3.7
Detoxification facilities (Fire Alarm)	428.12
Penetrations (Egress Lighting)	428.13
Penetrations (documentation)	703.2
Penetrations (cables and wires)	709.6.1 – 709.6.2
Penetrations (electrical outlet boxes)	709.6.3
Penetrations (protection)	713.4
Automatic Fire Doors (smoke closing)	716.5
Fire protection systems	901.0 complete
Fire protection system approval/acceptance	903.0 complete
Fire protective signaling systems	917.0 complete
Automatic fire detection systems	918.0 complete
Single and multiple-station smoke detectors	919.0 complete
Smoke control systems	921.0 complete
Supervision (fire suppression systems)	923.1
Fire protective signaling systems	923.2
Fire Pumps Emergency Power	924.3
Penetrations of interior stairway enclosures	1014.11.2
Exit signs and lights	1023.0 complete
Means of egress lighting	1024.0 complete
Light and ventilation required (bathroom, toilet room, and general)	1205.0 through 1209.0
Cutting, notching, and boring in wood framing members	2305.3
Electrical lighting fixtures	2604.5.4
Plenums	2805.0 complete
Power venters (power exhausters)	2812.0 complete
Elevator, dumbwaiter, and conveyor equipment installation requirements	Chapter 30 complete
Illuminated signs	3102.13
Portable signs	3102.14
Membrane Structures Standby Power	3103.4.2
Electrical system protection with reference to base flood elevation	3107.7
Precautions during building operations (lighting)	3315.0 complete
Historic buildings	3409.0 complete

†See note at the end of Appendix A.

780 CMR: CHAPTER 13 ENERGY CONSERVATION*

(6th Edition with changes and corrections up to November 27, 1998)

Recessed light fixtures (IC labeled)	1304.3.8; 1304.4.3; Appendix J, 4.3.4
Air leakage for all buildings (openings around wiring; outlet plate gaskets)	1304.3.1
Zoning for temperature control	1305.3.4
Heating, ventilating, and air-conditioning equipment	1305.0 complete
Electrical power distribution	1307.0 complete
Lighting systems	1308.0 complete
Building design by systems analysis	1315.0 complete
Energy provisions for existing buildings	3407.0 complete

*Note: For energy conservation provisions for low-rise residential occupancies, see Building Code Appendix J complete.

780 CMR: BUILDING CODE FOR ONE AND TWO FAMILY DWELLINGS

7th edition with changes and corrections up to April 1, 2007

Violation penalties	5118.4
Life safety systems (alarms)	5313
Membrane penetrations (electrical boxes)	5317.3.2
Protection of mechanical and electrical systems	4323.1.5
Walls below design flood elevation	5323.3.4
Cutting and notching (steel)	5603.3.4
Cutting and notching (roof members)	5802.7
Energy efficiency	6101
Recessed lighting fixtures	6106.3.4
On off switch. All pool heaters	6106.5.4.1
Electrical energy consumption (metering)	6106.6.1
Appliances under floors	6305.1.4
Heat pumps	6403.1
Radiant heating systems	6406.1
Duct heaters	6407
Clothes dryers exhaust	6501
Building Structure Protection:	8302
Drilling and notching (wood-framed structural members)	8302.1
Penetrations of fire-resistance-rated assemblies	8302.2
Penetrations of firestops and draft stops	8302.3
Foundation grounding	8505.1
Energy code	8802.1
Smoke heat detection and carbon monoxide alarm systems and CO detection and alarm	9304.8
Fire protection equipment	9309.2.2.1
Exit signs and emergency lights	9309.2.2.2

DIVISION OF INDUSTRIAL SAFETY

454 CMR 10.00 Construction Industry Rules and Regulations
Part 17
Tunnels and Shafts, Caissons, Cofferdams, and Compressed Air

10.175 Tunnels and Shafts
  Section 12 Electrical Equipment
10.178 Compressed Air
  Section 11 Electricity

ELEVATOR REGULATIONS

524 CMR 15.00 through 35.00

Appendix A: continued

BOARD OF STATE EXAMINERS OF PLUMBERS AND GAS FITTERS

248 CMR 6.00: NATIONAL FUEL GAS CODE (NFPA 54)

5.4.3(d): Proper permanent lighting shall be provided at the roof access. The switch for such lighting shall be located inside the building near the access means leading to the roof.

BOARD OF FIRE PREVENTION REGULATIONS

527 CMR 4.00: Oil Burning Equipment
- 4.04: Oil Burners, Light Fuel Oil Type
  - (3) Oil Burner Controls
  - (4) Electric Wiring and Equipment

527 CMR 5.00: Operation and maintenance of buildings or other structures used as garages, service stations and the related storage, keeping and use of gasoline or other motor fuel.
- 5.07 Dispensing Equipment
  - (2) Heat activated shutoff switch
  - (5) Emergency pump shutoff switches/circuit breakers

527 CMR 15.00: Keeping, handling and transportation of flammable and combustible liquids, and the disposition of crude petroleum or any of its products in harbors or other waters of the Commonwealth.
- 15.09 General Provisions [Marinas]
  - (1) a, b, c. Equipment ratings, emergency shutoffs, permitted wiring locations

105 CMR 410: MINIMUM STANDARDS OF FITNESS FOR HUMAN HABITATION (STATE SANITARY CODE, CHAPTER II)

410.250: Habitable Rooms Other than Kitchen—Natural Light and Electrical Outlets
410.251: Kitchen Lighting and Electrical Outlets
410.252: Bathroom Lighting and Electrical Outlets
410.253: Light Fixtures Other than in Habitable Rooms or Kitchens
410.254: Light in Passageways, Hallways, and Stairways
410.255: Amperage
410.256: Temporary Wiring
410.258: Exemption of Dwellings More than 600 Feet from Electrical Service
410.280: Natural and Mechanical Ventilation
410.281: Ventilation Shut-off
410.354: Metering of Electricity and Gas
410.482: Smoke Detectors and Carbon Monoxide Alarms
410.483: Auxiliary Emergency Lighting Systems and Exit Signs

521 CMR: ARCHITECTURAL ACCESS BOARD

39.3 HEIGHT

The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 521 CMR 6.5, Forward Reach and 521 CMR 6.6, Side Reach.

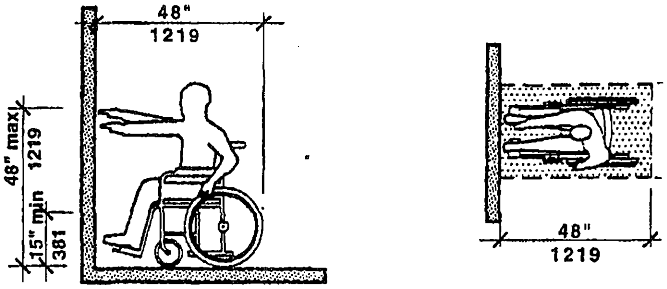
9.3.1 Electrical and communications system receptacles on walls shall be mounted between 15 inches (15" = 381mm) and 48 inches (48" = 1219mm) above the floor, measured at the centerline of the lowest receptacle.

Exception: These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants.

Appendix A: continued

39.4 LOCATION

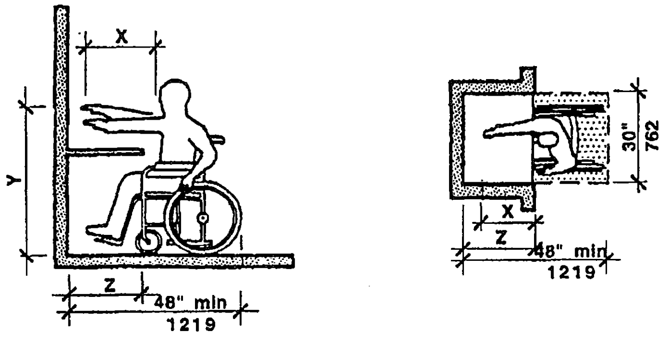
All such controls shall be located at least 18 inches (18" = 457mm) from an interior corner.



High Forward Reach Limit
Figure 6k

6.5 FORWARD REACH

If the *clear floor space* only allows forward approach to an object, the maximum high forward reach allowed shall be 48 inches (48" = 1219mm) (See Fig. 6k). The minimum low forward reach is 15 inches (15" = 381mm). If the high forward reach is over an obstruction, reach and clearances shall be as shown in Fig. 6l.



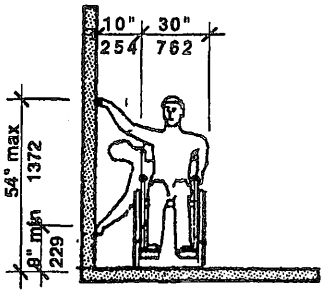
**NOTE: X shall be less than or equal to 25" (635 mm). Z shall be greater than X.
When X is less than 20" (508 mm), then Y shall be 48" (1219 mm) max.
When X is 20" to 25" (508 to 635 mm), then Y shall be 44" (1118 mm) max.**

Maximum Forward Reach over an Obstruction
Figure 6l

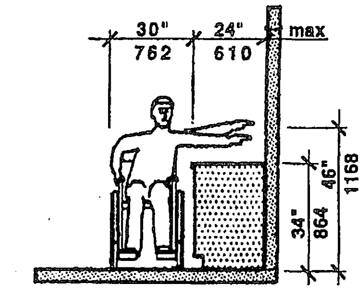
Appendix A: continued

6.6 SIDE REACH

If the *clear floor space* allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 inches (54" = 1372mm) and the low side reach shall be no less than nine inches (9" = 229mm) above the floor (See Fig. 6m). If the side reach is over an obstruction, reach and clearances shall be as shown in Fig. 6n.



High and Low Side Reach
Figure 6m



Maximum Side Reach over Obstruction
Figure 6n

†General Footnote to Appendix A: The provisions of the regulations cited in this appendix are noted to assist the users of this Code in properly considering various electrical design constraints of other building systems. They are generally unenforceable by an Inspector of Wires. See Rule 5 of this Code.

REGULATORY AUTHORITY

527 CMR 12.00: M..G.L. c. 22D, § 4; c. 143, § 3L; c. 148, § 10.

NON-TEXT PAGE

527 CMR 13.00: EXPLOSIVES

Section

13.01: Scope and Application
13.02: Appeals and Penalties
13.03: Definitions
13.04: Licenses, Permits and Certificates
13.05: Storage
13.06: Transportation
13.07: Explosive Material Mixing
13.08: Plosophoric Materials (Binary Explosive Material)
13.09: Use of Explosive Materials (Blasting)
13.10: Explosive Manufacturing
13.11: Small Arms Ammunition and Primers, Smokeless Propellents and Black Powder
13.12: General Provisions
13.13: References
13.14: Pre/Post Blast Inspection Waiver
13.15: Blasting Damage Complaint Form

13.01: Scope and Application

(1) Effective as of March 1, 1996, 527 CMR 13.00 shall apply to the manufacture, mixing, transportation, storage, sale, and use of explosives and explosive material.

(2) 527 CMR 13.00 shall not apply to:
(a) the interstate transportation of explosive materials when the transportation of such explosive materials is under the jurisdiction of the U.S. Department of Transportation (DOT). It shall, however, apply to intrastate transportation of explosive materials not subject to the jurisdiction of the U.S. Department of Transportation (DOT) and state and municipal supervision of compliance with the Hazardous Materials Regulations of DOT (Title 49, Code of Federal Regulations, Parts 100-199).
(b) the transportation and use of military explosive materials by federal or state military agencies, or the Coast Guard of the United States, nor shall it apply to the transportation and use of explosive materials by federal, state, or municipal agencies provided they are within their official capacity and while engaged in normal or emergency performance of duties.
(c) the manufacture of explosive materials under the jurisdiction of the U.S. Department of Defense. 527 CMR 13.00 shall also not apply to the distribution of explosive materials to or storage of explosive materials by military agencies of the United States or the Commonwealth of Massachusetts, nor shall it apply to arsenals, navy yards, or depots owned by or operated by or on behalf of the United States or the Commonwealth of Massachusetts.
(d) pyrotechnics such as flares, fuses, railway torpedoes.
(e) the use of explosive materials in medicines and medicine agents in the forms prescribed by the United States Pharmacopoeia or National Formulary.
(f) Fireworks regulated by 527 CMR 2.00.
(g) Model rockets regulated by 527 CMR 16.00.

(3) Equivalency. The State Fire Marshal may authorize alternate provisions to those in 527 CMR 13.00 to meet unusual conditions, if such alternate provisions provide equivalent degrees of safety and security.

(4) 527 CMR 13.00 is intended to provide reasonable safety in the manufacture, mixing, keeping, storage, transportation, sale, and use of explosive materials.

(5) The hazards of explosives require all enforcing authorities to strictly adhere to the provisions of 527 CMR 13.00.

13.02: Appeals and Penalties

(1) Massachusetts General Laws (M.G.L.) c. 148, §§ 15, 16, 31 and 35:
(a) § 15. Whoever knowingly violates or knowingly causes or permits the violation of any regulation adopted and prescribed for the transportation of gunpowder and other explosives or explosive or inflammable fluids or compounds shall be punished by a fine of not more than $1,000 or by imprisonment for not more than one year, or both.

13.02: continued

(b) § 16. Whoever keeps, stores, uses, manufactures, sells, handles or otherwise disposes of any of the articles mentioned in M.G.L. c. 148, § 9, in violation of M.G.L. c. 148, § 12 or 13 or of any regulation, ordinance or by-law made under M.G.L. c. 148, § 9, or whoever violates any regulation made under M.G.L. c. 148, § 13, or whoever, not being exempt from the provisions of M.G.L. c. 148, § 13 relating to the filing of a certificate of registration, fails to file said certificate and to pay such fee as may be established under M.G.L. c. 148, § 13, shall, except as provided in M.G.L. c. 148, § 15 and 35 and in M.G.L. c. 266, § 102A, be punished by a fine of not more than $100 or by imprisonment for not more than one month, or both.

(c) § 31. Any person aggrieved by any act, rule, order or decision of the head of a fire department, or other person or persons acting or purporting to act under authority derived from M.G.L. c. 148, except § 5, or any rule or regulation thereunder, may appeal to the Marshal, who shall make all necessary and proper orders thereon, but only in so far as the appeal presents a direct question of fire or explosion hazard. Such appeal shall be filed with the Marshal not later than ten days following the act, rule, order or decision appealed from.

(d) § 35. No person shall have in his possession or under his control any bomb or other high explosive, as defined by the rules and regulations made under M.G.L. c. 148, § 9, contrary to the provisions of M.G.L. c. 148, § 9 or of any rule or regulation made thereunder. Whoever violates M.G.L. c. 148, § 9 shall be punished by a fine of not more than $1,000, or by imprisonment for not more than 2½ years, or both, and any bomb or explosive found in his possession or under his control on such violation shall be forfeited to the Commonwealth. Any officer qualified to serve criminal process may arrest without a warrant any person violating M.G.L. c. 148, § 9.

13.03: Definitions

For the purpose of 527 CMR 13.00, the following terms shall have the meanings respectively assigned to them:

Acceptor, a charge of explosives or blasting agent receiving an impulse from an exploding donor charge.

Air blast, the airborne shock wave or acoustic transient generated by an explosion measured in units of pressure or decibels.

Ammunition, small-arms, any cartridge or shell for use in a pistol, rifle or shotgun, and shall include ball, shot or blank cartridges or shells.

Approved, approved by the State Fire Marshal.

Authority having jurisdiction, the Marshal or his designee.

Barricaded, the effective screening of a magazine containing explosive materials from another magazine, a building, a railway, or a highway, either by a natural barricade or by an artificial barricade. To be properly barricaded, a straight line from the top of any sidewall of the magazine containing explosive materials to the eave line of any other magazine or building, or to a point 12 feet above the center of a railway or highway, will pass through the natural or artificial barricade.

Artificial barricade, an artificial mound or revetted wall of earth of a minimum thickness of three feet, or any other approved barricade that offers equivalent protection.

Natural barricade, natural features of the ground, such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare of leaves.

Barrier, a material object or objects that separates, keeps apart, or demarcates in a conspicuous manner such as cones, a warning sign or tape.

Batch, the quantity of material produced as a single mixture at manufacture.

Bench, a horizontal ledge from which holes are drilled vertically down into the material to be blasted; benching is a process of excavating where a highwall is worked in steps or lifts.

13.03: continued

Binary explosive, see Plosophoric materials.

Black powder, a deflagrating or low explosive compound of an intimate mixture of sulfur, charcoal, and alkali nitrate, usually potassium or sodium nitrate.

Blast area, the area including the blast site and the immediate adjacent area that is owned, leased, or controlled by the blast operation.

Blaster, a person who holds a valid Certificate of Competency issued by the State Fire Marshal and qualified to be in charge of and responsible for the design, loading and firing of a blast. A blaster is recognized in his field as an explosives craftsman.

Blasting license, see Certificate of Competency.

Blasting agent, any material or mixture, consisting of fuel and oxidizer, that is intended for blasting and not otherwise defined as an explosive if the finished product as mixed for use or shipment cannot be detonated by means of a number 8 blasting cap when unconfined.

Note: A No. 8 blasting cap is one containing 2 grams of a mixture of 80% mercury fulminate and 20% potassium chlorate, or a blasting cap of equivalent strength.

Blasting cap, thin metal shells containing dry fulminate of mercury or other similar substance either alone or in combination with fulminate of mercury and fired by a slow-burning safety fuse, or arranged to be fired by an electric current.

Blasting log, a written record of information about a specific blast that is maintained by the blaster.

Blasting mat, a mat of woven steel wire, rope, scrap tires, or other suitable material, earth fill or construction to cover blast holes, for the purpose of preventing flyrock.

Blasting operation, any person engaged in the conduct of blasting under the terms of a contract or otherwise.

Blast site, the area in which explosive materials are being or have been loaded and which includes all holes loaded or to be loaded for the same blast and for a distance of 50 feet in all directions.

Blending, see mixing.

Board, the Board of Fire Prevention Regulations established under M.G.L. c. 22, § 14.

Boosters, an explosive charge, usually of high detonation velocity and detonation pressure, designed to be used in the explosive initiation sequence between an initiator and primer and the main charge.

Boot leg, the part of a drilled blast hole that remains when the force of the explosion does not break the rock completely to the bottom of the hole.

Borehole, a hole drilled in the material to be blasted, for the purpose of containing an explosive charge, also called blasthole or drill hole.

Building, Inhabited, means a building regularly occupied in whole or in part as a habitation for human beings, or any church, schoolhouse, railway station, store, or other structure where people are accustomed to assemble, except any building or structure occupied in connection with the manufacture, transportation, storage or use of explosives.

Bulk mix, a mass of explosive material prepared for use in bulk form without packaging.

Bulk mix delivery equipment, equipment (usually a motor vehicle with or without a mechanical delivery device) that transports explosive materials in bulk form for mixing or loading directly into bore holes, or both.

13.03: continued

Bullet-resistant Construction, with reference to magazine walls or doors, constructed so as to resist penetration of a bullet of 150 grain M2 ball ammunition having a nominal muzzle velocity of 2,700 fps when fired from a 0.30 caliber rifle from a distance of 100 feet perpendicular to the wall or door.

Bullet-sensitive Explosive Material, explosive material that can be detonated by 150 grain M2 ball ammunition having a nominal muzzle velocity of 2,700 fps when fired from a 0.30 caliber rifle at a distance of 100 feet, measured perpendicular. The test material is at a temperature of 70° to 75°F and is placed against a ½ inch steel plate.

Burden, the distance from the borehole and the nearest free face or the distance between boreholes measured perpendicular to the spacing.

Certificate of Competency [Blaster's License], is a license granted by the Marshal to a blaster which allows this person to be in charge of and responsible for the loading and firing of a blast.

CFR, Code of Federal Regulations.

Charge Activated Device, a device that utilizes an explosive charge to promote the breaking of rock or concrete by hydraulic or gas means.

Detonating Cord, a flexible cord containing a center core of high explosive which can be used to initiate other explosives.

Detonator, any device containing an initiating or primary explosive that is used for initiating detonation. A detonator may not contain more than 10 g of total explosive material per unit, excluding ignition or delay charges. The term includes, but is not limited to, electric detonators of instantaneous and delay types, detonators for use with safety fuses, detonating cord delay connectors, and non electric detonating cord, shock tube, or any other replacement for electric leg wires.

Donor, an exploding charge producing an impulse that impinges upon an explosive acceptor charge.

DOT, means the United States Department of Transportation.

Electric Squibs, small tubes or blocks containing a small quantity of ignition compound in contact with a wire bridge.

Emulsion, an explosive material containing substantial amounts of oxidizer [ammonium nitrates] dissolved in water droplets, surrounded by an immiscible fuel [oil-like material], or droplets of an immiscible fuel surrounded by water containing amounts of oxidizer.

Explosive, any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion; *i.e.*, with substantially instantaneous release of gas and heat. In 527 CMR 13.00, explosives shall be a Class 1 Explosive Materials. Class 1 Explosives Materials shall be divided into six divisions, the divisions being characteristic of the properties and hazards of the particular explosive materials. The Divisions of Class 1 Explosives Materials shall be:

Division 1.1: explosives that have a mass explosion hazard. A high explosive. (Formerly class A explosives)

Division 1.2: explosives that have a projection hazard but not a mass explosion hazard. A high explosive. (Formerly class A or class B explosives)

Division 1.3: explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard, or both, but not a mass explosion hazard. A low explosive. (Formerly class B explosives)

Division 1.4: explosives that present a minor explosion hazard. An external fire must not cause virtual instantaneous explosion of almost the entire contents of the package. No device may contain more than 25 g (0.9 oz) of a detonating material. A low explosive. (Formerly a class C explosive)

Division 1.5: very insensitive explosive materials that have a mass explosion hazard but are so insensitive that there is little or no probability of initiation or of transition from burning to detonation under normal conditions of transport. (Formerly a blasting agent)

13.03: continued

Division 1.6: extremely insensitive articles that do not have a mass explosion hazard, and articles that demonstrate a negligible probability of accidental initiation or propagation. (No applicable hazard class)

Explosive bombs or Bomb, any explosive material or other chemical compound or mixture kept, used or possessed as a destructive device for the purpose of causing injury or damage to persons or property or both on ignition or detonation.

Explosive material, any explosive, blasting agent or detonator. The term includes, but is not limited to, dynamite and other explosives; slurries, emulsions and water gels; black powder; pellet powder; initiating explosives; detonators (blasting caps); safety fuse; squibs; detonating cord; smokeless propellants; small arms ammunition; small arms percussion caps; smokeless primers; igniter cord; and ignitors.

Note: The term also includes any material determined to be contained in the list of explosive materials provided for in 27 CFR 55.23.

Explosives Users Certificate [Own and Possess Certificate], a certificate granted by the State Fire Marshal to a firm or company, indicating the rebuttable presumption of statutory and regulatory compliance with responsible levels of liability insurance and bonds required by M.G.L. c. 148, §§ 19, 20 and 20A, explosive storage magazines, and a general knowledge of the requirements of explosive regulations.

Fire resistant construction, construction designed to offer reasonable protection against fire. For exterior walls of magazines constructed of wood, this may mean fire resistance equivalency provided by sheet metal of not less than 26 gauge.

Flyrock, rock(s) propelled by the force of an explosive blast which travel beyond the blast area.

Free face, a rock surface exposed to air or water which provides room for expansion upon fragmentation; sometimes called open face.

Fuel, any substance that will react with the oxygen in the air or with the oxygen yielded by an oxidizer to produce combustion.

Fuse, Primer, a length of safety fuse to one end of which is crimped a blasting cap.

Fuse, Safety, a flexible cord containing an internal burning medium by which fire is conveyed at a continuous and uniform rate for the purpose of firing blasting caps or explosive charge.

Fuse, Tracer, devices attached to projectiles and containing a slow-burning composition.

Harbor Masters, as provided for by M.G.L. c. 102, § 19.

Head of the local fire department, the chief executive officer of the fire department in a city, town or fire district having such an officer, otherwise the fire commissioner, board of fire commissioners or fire engineers, or local commissioner of public safety; and in towns not having a fire department, the chief engineer, if any, otherwise the chairman of the board of selectmen or their designees.

Highway, any public street, public alley, or public road.

Igniters, Delay Electric, small metal tubes containing a wire bridge in contact with a small quantity of ignition compound.

IME, the Institute of Makers of Explosives.

13.03: continued

Inhabited building, means a building regularly occupied in whole or part as habitation for human beings, or any church, schoolhouse, railroad station, store, or other structure where people are accustomed to assemble, except any building or structure occupied in connection with the manufacture, transportation, storage or use of explosive materials.

Initiator, a detonator, detonating cord or similar device used to start detonation or deflagration in an explosive material.

Intrastate, commerce within the state, as opposed to commerce between the states (*i.e.* interstate).

Listed, equipment or materials included in a list published by an organization acceptable to the Marshal and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

Note: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.

Magazine, means any building or structure, other than an "explosive manufacturing building," used for the storage of explosives as described in 527 CMR 13.05.

Manufacturer of explosives, any person licensed in accordance with 27 CFR Part 55, and engaged in the business of manufacturing explosives for the purpose of sale or distribution.

Manufacturing building, means any building or other structure (except magazines) in which the manufacture of explosive materials or any processing involving the manufacture of explosive material is carried on, and any building where explosive materials are used as a component part or ingredient in the manufacture of any explosive article or device.

Marshal, the State Fire Marshal or his designee.

Misfire, a charge of explosive material that fails to detonate completely after initiation.

Mixing, bulk mixed material blended by a person trained by the explosive material manufacturer to handle and mix material used to enhance blasting operations. This mixed material shall not be classified as an explosive and shall include non cap sensitive blasting Agents, slurry, emulsion or water gel, mixtures.

Own and Possess Certificate, see Explosives Users Certificate.

Oxidizing material, a substance such as nitrate that readily yields oxygen or other oxidizing substances to stimulate the combustion of organic matter or other fuel.

Person, means any natural person, partnership, firm, association, or corporation.

Permit to blast, see Use and Handling permit.

Plosophoric materials [Binary explosives], two of more unmixed, commercial manufactured, prepackaged chemical ingredients including oxidizers, flammable liquids or solids, or similar substances that are not independently classified as explosives but which when mixed or combined form a mixture that is classified as an explosive and that is intended for blasting. It may be classified by the Hazardous Materials Regulations of the U.S. Department of Transportation as an explosive depending on its susceptibility to detonation.

13.03: continued

Primer, a unit, package or cartridge of explosives used to initiate other explosives or blasting agents, and which contains:

(a) a detonator; or
(b) detonating cord to which is attached a detonator designed to initiate the detonating cord.

Propellant, see Smokeless propellant.

Quarry, any property which may primarily be used as a source of mined products from the earth when the removal of such products requires the use of explosives to facilitate such removal.

Temporary quarry [Borrow pit], any quarry associated with a road building or other construction project.

Railway, means any public steam, electric, or other public railroad or public railway which carries passengers for hire.

Scaled distance, a factor relating similar blast effects from various weight charges of explosive material at various distances. Scaled distance referring to blasting effects is obtained by dividing the distance of concern by a fractional power of the weight of the explosive materials.

Sensitivity, a characteristic of an explosive material classifying its ability to detonate upon receiving an external impulse such as impact shock, flame, or other influence that can cause explosive decomposition.

Cap-sensitive explosive material, any explosive material that can be detonated by means of a No. 8 blasting cap or its equivalent. Cap-sensitive material SHALL be classified as an explosive.

Non cap-sensitive explosive material, any explosive material that can NOT be detonated by means of a No. 8 blasting cap or its equivalent. Non cap-sensitive material SHALL NOT be classified as an explosive.

Shock tube, a small diameter plastic tube used for initiating detonators. it contains only a limited amount of reactive material so that the energy that is transmitted through the tube by means of a detonation wave is guided through and confined within the walls of the tube.

Slurry, see Water Gel.

Small arms ammunition, any shotgun, rifle, or pistol cartridge and any cartridge or propellant-actuated devices. This definition does not include military ammunition containing bursting charges or incendiary, tracer, spotting, or pyrotechnic projectiles.

Small arms ammunition primers, small percussion sensitive explosive charges, encased in a cap, used to ignite propellant powder.

Smokeless propellants, solid propellants, commonly referred to as smokeless powders, used in small arms ammunition, cannons, rockets, propellant-actuated devices, *etc.*

Spacing, the distance between boreholes in bench blasting. The distance is measured parallel to the free face and perpendicular to the burden.

Stemming, a suitable inert non combustible material or device used to confine or separate explosives in a drill hole.

Structure, a combination of materials assembled at a fixed location to give support or shelter, such as a building.

Theft resistant, construction designed to deter illegal entry into facilities used for the storage of explosive material.

13.03: continued

Use and Handling permit [Permit to Blast], a permit granted by the head of the local fire department to a person requesting to detonate explosives. This permit establishes the terms and conditions of fire and explosion safety specific to the blast area.

Velocity, the measurement of speed

Velocity, particle, the velocity at which the earth vibrates, measured in inches per second.

Velocity, peak particle, the highest recorded particle velocity.

Velocity, seismic, the velocity at which a vibration or seismic wave travels outward from the source. It is measured in thousands of feet per second.

Vibration, blasting, the energy from a blast that manifests itself in vibrations which are transmitted through the earth away from the immediate blast area .

Vibration, ground, shaking the ground, by elastic waves emanating from a blast; usually measured in inches per second of particle velocity.

Vibration, frequency, the number of cycles of vibration per unit of time. The units of frequency are in cycles per second or Hertz (Hz).

Water gel or slurry, a wide variety of materials used for blasting manufactured with varying degrees of sensitivity to initiation and may be classified as explosives or non explosive blasting agents. Water gels may be premixed at an explosive manufacturing building or mixed at the site immediately before delivery into the borehole.

Weather resistant construction, construction designed to offer reasonable protection against weather.

Note: Words used in the singular number shall include the plural, and the plural the singular.

13.04: Licenses, Registrations, Permits and Certificates

(1) Exemption: License, Registration, or Permit: In accordance with the provisions of M.G.L. c. 148 § 13, the Board hereby prescribes the following quantities of explosive materials that shall be exempt from License, Registration, and Permit and may be kept, or stored in a building or other structure:

(a) Small Arms Ammunition
  1. Not more than 10,000 rounds of rim fire ammunition.
  2. Not more than 10,000 rounds of center fire ammunition.
  3. Not more than 5,000 rounds of shotgun ammunition.

(b) Small Arms Ammunition Primers
  1. Not more than 1,000 caps or other small arms primers.

(c) Smokeless Propellants
  1. Not more than 16 pounds.
  2. Persons under 18 years of age may not keep or store Smokeless Propellants.
  3. Not more than two pounds of such propellant shall be stored in a multiple family dwelling or a building of public access.

(d) Black Powder
  1. Not more than two pounds.
  2. Persons under 18 years of age may not keep or store black powder.

(e) Exempt quantities of small arms ammunition, primers, smokeless propellants and black powder shall be stored in original containers and such containers shall be stored in a locked cabinet, closet or box when not in use.

(f) Special industrial explosive devices when in quantities of less than 50 pounds net weight of explosives.

13.04: continued

(2) Storage By Permit: In accordance with the provisions of M.G.L. c. 148 § 13, the Board hereby prescribes the following quantities of explosive materials that shall be exempt from License, and Registration, and may be kept, or stored in a building or other structure provided a permit has been obtained from the head of the local fire department;

(a) Small Arms Ammunition: Private Use. Small arms ammunition in amounts over that specified in 527 CMR 13.04(1), that do not exceed 100,000 total rounds at any one time, may be kept for private use provided none of the individual limitations listed below are exceeded.

1. 10,001 to 30,000 rounds of rim fire ammunition.

2. 10,001 to 50,000 rounds of center fire ammunition not to include shotgun ammunition.

3. 10,001 to 50,000 rounds of shotgun ammunition not to include center fire ammunition.

(b) Small Arms Ammunition: Commercial Use. Not to exceed 200,000 rounds in any combination.

(c) Small Arms Ammunition Primers: Private Use
Not to exceed 10,000 Small Arms Ammunition Primers.

(d) Small Arms Ammunition Primers: Commercial Use
Not to exceed 100,000 Small Arms Ammunition Primers.

(e) Smokeless Propellants: Private Use

1. Not to exceed 48 pounds Smokeless Propellants.

2. Persons under 18 years of age may not keep or store Smokeless Propellants.

3. The head of the local fire department may limit the quantity of smokeless propellants stored by permit to as low as two pounds if such propellant shall be stored in a multiple family dwelling or a building of public access.

(f) Smokeless Propellants: Commercial Use
Not to exceed 100 pounds smokeless propellant.

(g) Black Powder: Private Use

1. Not to exceed five pounds of black powder.

2. Persons under 18 years of age may not keep or store black powder.

3. The head of the local fire department may limit the quantity of black powder stored by permit to as low as two pounds if such black powder shall be stored in a multiple family dwelling or a building of public access.

(h) Black Powder: Commercial Use
Not to exceed 50 pounds of black powder.

(3) Local and State Requirements for Buildings or Structures Used To Keep, Store or Manufacture Explosive Materials:

(a) In accordance with the provisions of M.G.L. c. 148, §13, all quantities of explosive materials not exempted or allowed by permit shall require a license, granted by the local licensing authority, and a registration, to be kept, or stored in a building or other structure.

(b) In addition to the local requirements required by 527 CMR 13.04(3)(a), as of January 1, 2003, no magazine, building or structure shall be used for the manufacturing or storage of explosive materials without a permit issued by the Marshal in accordance with the provisions of M.G.L. c. 148, § 12. For the purposes of 527 CMR 13.04(3)(b) the term "explosive materials" shall be defined as "Explosive" as defined in 527 CMR 13.03.

1. Permits for the manufacture of explosive materials shall be obtained from the Marshal in accordance with 527 CMR 13.04(5) and 527 CMR 13.10

2. Permits for the storage of explosive materials in any magazine, building or structure shall be obtained from the marshal by the owner of said magazine, building or structure. The application for said permit shall contain the location of the subject magazine building or structure, the nature and quantity of explosives materials to be stored, and the capacity and specifications of the storage and any other information as prescribed by the Marshal in said application.

3. No permit or renewal thereof shall be issued by the Marshal under 527 CMR 13.04(3)(b) until the owner of said magazine, building or structure provides proof that the owner has met all requirements required by State and Federal law or regulation.

4. The Marshal may suspend or revoke a permit issued under 527 CMR 13.04(3)(b) if the marshal has reason to believe that the permit holder has violated the provisions of 527 CMR 13.00, or any law or other regulation related thereto.

13.04: continued

5. Any person who has applied for or has been issued such a permit or a renewal thereof by the marshal, under 527 CMR 13.04(3)(b), shall be deemed to have consented to periodic administrative inspections by the Marshal or his designees of any building, structure, magazine or facility used to store or manufacture such explosive materials and all records relating thereto.
6. Any owner who has been issued a permit under 527 CMR13.04(3)(b) shall notify the Marshal immediately of the sale or transfer of a magazine, building or structure. The owner shall remove the permit number from the magazine, building or structure upon sale or transfer. The transferee shall immediately apply for a new permit for the magazine, building or structure in accordance with 527 CMR 13.04(3)(b).

(4) Additional Requirements Permitted and Exempt Explosive Material: Storage and transportation of explosive material shall be subject to all additional applicable transportation and storage requirements of 527 CMR 13.00.

(5) Manufacture of explosives: A permit for the Manufacture of Explosive Material shall be obtained from the Marshal. Applicants for a permit to Manufacture Explosives shall submit proof of license to manufacture explosives issued in accordance with 27 CFR Part 55, and a license and registration to keep, store, manufacture or sell explosive material issued in accordance with M.G.L. c. 148, § 13.

(6) Transportation of Explosive Material: Interstate transportation of explosive material not exempted by 527 CMR 13.01, shall require a permit to be issued by the State Fire Marshal subject to 527 CMR 13.06.

(7) Storage of Explosive Materials: No person shall keep, store, mix, manufacture, use, handle, or sell explosive material except in accordance with 527 CMR 13.00.
(a) explosives materials kept or stored for use on a job site shall be in magazines approved in accordance with the provisions of 527 CMR 13.05;
(b) a permit from the head of the local fire department or the Marshal shall be required for the storage of explosives not specifically covered by 527 CMR 13.00.
(c) all such permits for the storage of explosives referred to in 527 CMR 13.00 shall remain in effect for a minimum period of one year and may be renewed annually, thereafter, unless suspended or revoked for cause by the head of the local fire department or the Marshal. Such permits shall be obtained from the head of the fire department having jurisdiction in the city or town where the material is to be stored, or the Marshal in all other jurisdictions.

(8) Exemption: From Aggregate Capacity of a License. Explosive material classified Division 1.5 and 1.6 shall not be regulated as an explosive in determining capacities subject to license requirements of M.G.L. c. 148, § 13 or 527 CMR 13.00.

(9) Certificate of Competency [Blaster's License]: No person shall conduct blasting operations unless they possess a Certificate of Competency [Blaster's License] granted by the State Fire Marshal.

Any person desiring a Certificate of Competency shall make application in writing to the Marshal, be 21 years of age or older, and shall submit to such examination and test as the Marshal may prescribe. The certificate, when issued, shall remain in effect for a period of two years unless suspended or revoked by the Marshal.

(10) Explosives Users Certificate [Own and Possess Certificate]: No person or firm shall use explosives unless they possess an Explosives Users Certificate [Own and Possess Certificate] granted by the Marshal.
(a) Application for an Explosives Users Certificate shall be made to the Marshal and shall include the following:
1. Evidence of valid liability insurance coverage in the form of a certificate issued by the insurance agency to the Marshal's Office listing the name and claims representative, providing general liability in the amount of $1,000,000 per occurrence and $1,000,000 aggregate coverage. A 30 day cancellation notice to the Marshal shall be a condition of the policy.

13.04: continued

Any insurance company providing coverage under 527 CMR 13.00 shall be licensed in the Commonwealth of Massachusetts by the Commissioner of Insurance.

2. Evidence of a valid blasting bond.

3. A notarized statement indicating that explosive materials shall be kept in magazines which meet the requirements of 527 CMR 13.05 or a valid magazine license issued in accordance with 27 CFR Part 55.

4. A notarized statement attesting the person or firm understands the contents of 527 CMR 13.00 and M.G.L. c. 148. The statement shall be made a part of the application.

(b) The Explosives Users Certificate shall expire upon the expiration of the bond, or the liability insurance, which ever occurs first. The Explosives Users Certificate may be revoked by the Marshal for a failure to comply with 527 CMR 13.00, or M.G.L. c. 148.

(c) The Explosives Users Certificate shall be presented along with a Certificate of Competency when applying for a "Use and Handling "permit [Permit to Blast].

(d) Any person who has applied for or has been issued or has renewed an Explosives Users Certificate by the Marshal under 527 CMR 13.04(10), shall be deemed to have consented to periodic administrative inspections by the Marshal or his designee of any building, structure, magazine or facility used by said certificate holder to keep or store such explosive materials and all records relating thereto.

(11) Use and Handling Permit [Permit to Blast]: No person shall detonate explosives unless they possess a Use and Handling permit [Permit to Blast] issued to the blaster by the head of the local fire department, or the Marshal in a jurisdiction other than a city or town.

(a) Said Use and Handling permit shall not be issued until the person exhibits:

1. A valid "Certificate of Competency";
2. A valid Explosives Users Certificate; and
3. A Dig-Safe number has been obtained in accordance with M.G.L. c. 82, § 40.

(b) A valid "Use and Handling" permit shall be in possession of the blaster at the blast site and shall be produced for inspection, in hand, when requested by the head of the local fire department, the Marshal, or their designees.

(c) The head of the local fire department may verify, through the Marshal, that an Explosives Users Certificate and a "Certificate of Competency" is valid.

(d) The head of the local fire department or the Marshal may restrict the terms and conditions of a "Use and Handling" permit if hazards to the safety of the public, not covered by 527 CMR 13.00, are documented in writing and made a part of the restricted permit.

NON-TEXT PAGE

13.04: continued

(e) When issued, a " Use and Handling" permit shall remain in effect for a minimum of 30 days unless suspended or revoked by the head of the local fire department, the Marshal or their designees. If requested by the head of the local fire department upon granting of the permit, the local fire department shall be notified each day any blasting operations are to be performed at least two hours prior to such operations. Failure to notify will be cause for revocation of the "Use and Handling" permit. A "Use and Handling" permit may be suspended or revoked by the head of the local fire department or the Marshal or their designees for any violation of 527 CMR 13.00, or M.G.L. c. 148.

1. The head of the local fire department may extend the length of time the permit shall be in effect before renewal is required.

2. The Marshal or the head of the local fire department may, at his discretion at any time he deems it necessary, order a suitable fire watch on the explosive materials from the time the explosive materials are delivered to the blast area until the termination of blasting operations and the removal of all explosive material from the site.

(12) Sale of Explosive Material. No person shall sell or posses for purpose of sale any explosive material without a license to sell explosives granted by the State Fire Marshal. Application for a license to sell explosive material shall be made on a form approved by the Marshal.

Exception: 527 CMR 13.04(12) shall not apply to the sale of small arms ammunitions as defined in 527 CMR 13.03

13.05: Storage

(1) Types of Magazines: For the purpose of 527 CMR 13.00, there are five types of magazines. These types, together with the classes of explosive materials which shall be stored in them are as follows;

(a) Type 1 magazines: Permanent magazines for the storage of high explosives. Other classes of explosive material may be stored in Type 1 magazines.

(b) Type 2 magazines: Mobile and portable indoor and outdoor magazines for the storage of high explosives. Other classes of explosive materials may also be stored in type 2 magazines.

(c) Type 3 magazines: Portable outdoor magazines for the temporary storage of high explosives while attended (for example, a "day-box". Other classes of explosive material may also be stored in type 3 magazine.

(d) Type 4 magazines: Magazines for the storage of low explosives. Blasting agents may be stored in type 4 magazines. Detonators that will not mass detonate may also be stored in type 4 magazines.

(e) Type 5 magazines: Magazines for the storage of blasting agents.

Explosive materials classified as Class 1 materials. Class 1 materials are divided into Divisions, numbered 1 through 6 to indicate their relative hazard. Additionally, all explosive materials are further assigned a Compatibility Letter to show which explosive materials, when grouped together, will not significantly increase the probability of an accident, or for a given quantity, increase the magnitude of the effects from such an accident.

COMPATIBILITY GROUPS WHICH MAY BE STORED TOGETHER

Compatibility Group	A	B[1]	C[2]	D[2]	E[2]	S[1]
A	YES	NO	NO	NO	NO	NO
B	NO	YES	NO	NO	NO	YES
C	NO	NO	YES	YES	YES	YES
D	NO	NO	YES	YES	YES	YES
E	NO	NO	YES	YES	YES	YES
S	NO	YES	YES	YES	YES	YES

13.05: continued

Note 1: No detonators shall be stored in the same magazine with other explosive materials.
EXCEPTION: Detonators which are not mass detonating may be stored with safety fuse, electric squibs, igniters, or igniter cord in Type 1,2, 3 or 4 magazines.
Note 2: When compatibility Groups C, D, and E are stored in the same magazine the entire quantity must be considered as Compatibility Group E.

(2) Magazine Construction: Magazines in which explosives are kept and stored shall be of five types, as follows:

(a) Type 1 magazines: A type 1 magazine is a permanent structure: a building, an igloo or "Army-type structure", a tunnel, or a dugout. It shall be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated.

Buildings. All building type magazines shall be constructed of masonry, wood, metal, or a combination of these materials, and have no openings except for entrances and ventilation. The ground around building magazines shall slope away for drainage or other adequate drainage shall be provided.

1. Masonry wall construction. Masonry wall construction shall consist of brick, concrete, tile, cement block, or cinder block and be not less than six inches in thickness. Hollow masonry units used in construction shall have all hollow spaces filled with well-tamped, coarse, dry sand or weak concrete (at least a mixture of one part cement and eight parts of sand with enough water to dampen the mixture while tamping in place). Interior walls shall be constructed of, or covered with, a non sparking material.
2. Fabricated metal wall construction. Metal wall construction shall consist of sectional sheets of steel or aluminum not less than number 14-gauge, securely fastened to a metal framework. Metal wall construction shall be either lined inside with brick or solid cement blocks, or shall have at least a six inch sand fill between interior and exterior walls. Interior walls shall constructed of, or covered with, a non sparking material.
3. Wood frame wall construction. The exterior of outer wood walls shall be covered with iron or aluminum not less than number 26-gauge. An inner wall of, or covered with non sparking material shall be constructed so as to provide a space of not less than six inches between the outer and inner walls. The space shall be filled with coarse, dry sand or weak concrete.
4. Floors. Floors shall be constructed of, or covered with, a non sparking material and shall be strong enough to bear the weight of the maximum quantity to be stored. Use of pallets covered with a non sparking material is considered equivalent to a floor constructed of or covered with a non sparking material.
5. Foundations. Foundations shall be constructed of brick, concrete, cement block, stone, or wood posts. If piers or posts are used in lieu of a continuous foundation, the space under the buildings shall be enclosed with metal.
6. Roof. Except for buildings with fabricated metal roofs, the outer roof shall be covered with no less than number 26-gauge iron or aluminum, fastened to at least one inch nominal sheathing, ¾ inch plywood, or ¾ inch particle board.
7. Bullet-resistant ceilings or roofs. Where it is possible for a bullet to be fired directly through the roof and into the magazine at such an angle that the bullet would strike the explosives within, the magazine shall be protected by one of the following methods:
   a. A sand tray lined with a layer of building paper, plastic, or other nonporous material, and filled with not less than four inches of coarse, dry sand, and located at the tops of inner walls covering the entire ceiling area, except that portion necessary for ventilation.
   b. A fabricated metal roof constructed of 3/16 inch plate steel lined with four inches of hardwood. (For each additional 1/16 inch of plate steel, the hardwood lining may be decreased one inch.
8. Doors. All doors shall be constructed of not less than ¼ inch plate steel and lined with at least two inches of hardwood. Hinges and hasps shall be attached to the doors by welding, riveting or bolting (nuts on inside of door). They shall be installed in such a manner that the hinges and hasps cannot be removed when the doors are closed and locked.

13.05: continued

9. Locks. Each door shall be equipped with:
   a. Two mortise locks;
   b. Two padlocks fastened in separate hasps and staples;
   c. A combination of a mortise lock and a padlock;
   d. A mortise lock that requires two keys to open; or,
   e. A three-point lock.

Note: A five-blade lock also meets requirements. Padlocks shall have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks shall be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

10. Ventilation. Ventilation shall be provided to prevent dampness and heating of stored explosive materials. Ventilation openings shall be screened to prevent the entrance of sparks. Ventilation openings in side walls and foundations shall be offset or shielded for bullet-resistant purposes. Magazines having foundation and roof ventilators with the air circulating between the side walls and the floors and between the side walls and the ceiling shall have a wooden lattice lining or equivalent to prevent the packages of explosive materials from being stacked against the side walls and blocking the air circulation.

11. Exposed metal. No sparking material shall be exposed to contact with the stored explosive materials. All ferrous metal nails in the floor and side walls, which might be exposed to contact with explosive materials, shall be blind nailed, countersunk, or covered.

Igloos, "Army-type structures", tunnels, and dugouts: Igloo: "Army-type structure", tunnel, and dugout magazines shall be constructed of reinforced concrete, masonry, metal, or a combination of these materials. They shall have an earth mound covering of not less than 24 inches on the top, sides and rear unless the magazine meets the requirements of 527 CMR 13.05(2)(a)7.. Interior walls and floors shall be constructed of, or covered with, a non sparking material. Magazines of this type shall also be constructed in conformity with the requirements of 527 CMR 13.05(2)(a)4. and 527 CMR 13.05(2)(a)8. through 11..

(b) Type 2 magazines: A type 2 magazine is a box, trailer, semi-trailer, or other mobile facility.

1. Outdoor magazines.

a. General. Outdoor magazines shall be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated. They shall be supported to prevent direct contact with the ground and, if less than one cubic yard in size, shall be securely fastened to a fixed object. The ground around outdoor magazines shall slope away for drainage or other adequate drainage shall be provided. When unattended, vehicular magazines shall have wheels removed or otherwise effectively immobilized by kingpin locking devices or other methods approved by the Marshal.

b. Exterior construction. The exterior and doors shall be constructed of not less than ¼ inch steel and lined with at least two inches of hardwood. Magazines with top openings shall have lids with water-resistant seals or which overlap the sides by at least one inch when in a closed position.

c. Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

d. Locks. Each door shall be equipped with:
   i. Two mortise locks;
   ii. Two padlocks fastened in separate hasps and staples;
   iii. A combination of a mortise lock and a padlock;
   iv. A mortise lock that requires two keys to open; or,
   v. A three-point lock.

13.05: continued

Note: A five-blade lock also meets requirements. Mobile outdoor magazines need have only one lock, and no hood is required. Padlocks shall have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks shall be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

2. Indoor magazines.

a. General. Indoor magazines shall be fire-resistant and theft-resistant. They need not be bullet-resistant and weather-resistant if the buildings in which they are stored provide protection from the weather and from bullet penetration. No indoor magazine shall be located in a residence or dwelling. The indoor storage of high explosives shall not exceed a quantity of 50 pounds. More than one indoor magazine may be located in the same building if the total quantity of explosive materials stored does not exceed 50 pounds. Detonators shall be stored in a separate magazine (except as provided in 527 CMR 13.05(5)(b)2. and the total quantity of detonators shall not exceed 5,000.

b. Exterior construction. Indoor magazines shall be constructed of wood or metal according to one of the following specifications:

i. Wooden indoor magazines shall have sides, bottoms and doors constructed of at least two inches of hardwood and shall be well braced at the corners. They shall be covered with sheet metal of not less than number 26-gauge (.0179 inches). Nails exposed to the interior of magazines shall be countersunk.

ii. Metal indoor magazines shall have sides, bottoms and doors constructed of not less than number 12-gauge (.1046 inches) metal and shall be lined inside with a non sparking material. Edges of metal covers shall overlap sides at least one inch.

c. Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

d. Locks. Each door shall be equipped with:

i. Two mortise locks;
ii. Two padlocks fastened in separate hasps and staples;
iii. A combination of a mortise lock and a padlock;
iv. A mortise lock that requires two keys to open; or,
v. A three-point lock.

Note: A five-blade lock also meets requirements. Padlocks shall have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks shall be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples.

Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter, if the door hinges and lock hasps are securely fastened to the magazine. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

3. Detonator boxes. Magazines for detonators in quantities of 100 or less shall have sides, bottoms and doors constructed of not less than number 12-gauge (.1046 inches) metal and lined with a non sparking material. Hinges and hasps shall be attached so they cannot be removed from the outside. One steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter is sufficient for locking purposes.

(c) Type 3 magazines: A type 3 magazine is a "day-box" or other portable magazine. It shall be fire-resistant, weather-resistant, and theft-resistant. A type 3 magazine shall be constructed of not less than number 12 gauge (.1046) steel, lined with at least either ½ inch plywood or ½ inch Masonite-type hardboard.

1. Doors shall overlap door openings by at least one inch. Hinges and hasps shall be attached by welding, riveting or bolting (nuts on inside).

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2. One steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter is sufficient for locking purposes. Explosive materials shall not be left unattended in type 3 magazines and shall be removed to type 1 or 2 magazines for unattended storage.

(d) Type 4 magazines: A type 4 magazine is a building, igloo, or "Army type structure," tunnel, dugout, box, bin, trailer, or a semi-trailer or other mobile magazine.

1. Outdoor magazines.

a. General. Outdoor magazines shall be fire-resistant, weather-resistant, and theft-resistant. The ground around outdoor magazines shall slope away for drainage or other adequate drainage be provided. When unattended, vehicular magazines shall have wheels removed or otherwise be effectively immobilized by kingpin locking devices or other methods approved by the Marshal.

b. Construction. Outdoor magazines shall be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. Foundations shall be constructed of brick, concrete, cement block, stone, or metal or wood posts. If piers or posts are used, in lieu of a continuous foundation, the space under the building shall be enclosed with fire-resistant material. The walls and floors shall be constructed of, or covered with, a non sparking material or lattice work. The doors shall be metal or solid wood covered with metal.

c. Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

d. Locks. Each door shall be equipped with:

i. Two mortise locks;
ii. Two padlocks fastened in separate hasps and staples;
iii. A combination of a mortise lock and a padlock;
iv. A mortise lock that requires two keys to open; or,
v. A three-point lock.

Note: A five-blade lock also meets requirements. Mobile outdoor magazines need have only one lock, and no hood is required. Padlocks shall have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks shall be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

2. Indoor magazines.

a. General. Indoor magazines shall be fire-resistant and theft-resistant. They need not be weather-resistant if the buildings in which they are stored provide protection from the weather. No indoor magazine shall be located in a residence or dwelling. The indoor storage of low explosives shall not exceed a quantity of 50 pounds. More than one indoor magazine may be located in the same building if the total quantity of explosive materials stored does not exceed 50 pounds. Detonators that will not mass detonate shall be stored in a separate magazine and the total number of electric detonators shall not exceed 5,000.

b. Construction. Indoor magazines shall be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. The walls and floors shall be constructed of, or covered with, a non sparking material. The doors shall be metal or solid wood covered with metal.

c. Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

d. Locks. Each door shall be equipped with:

i. Two mortise locks;
ii. Two padlocks fastened in separate hasps and staples;
iii. A combination of a mortise lock and a padlock;
iv. A mortise lock that requires two keys to open; or,
v. A three-point lock.

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Note: A five-blade lock also meets requirements. Padlocks shall have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks shall be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples.

Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter, if the door hinges and lock hasps are securely fastened to the magazine . These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(e) Type 5 magazines: A type 5 magazine is a building, igloo, or "Army type structure," tunnel, dugout, box, bin, trailer, or a semi-trailer or other mobile facility.

1. Outdoor magazines.

a. General. Outdoor magazines shall be weather-resistant, and theft-resistant. The ground around magazines shall slope away for drainage or other adequate drainage be provided. When unattended, vehicular magazines shall have wheels removed or otherwise be effectively immobilized by kingpin locking devices or other methods approved by the Marshal.

b. Construction. The doors are shall be constructed of solid wood or metal.

c. Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

d. Locks. Each door shall be equipped with:

i. Two mortise locks;
ii. Two padlocks fastened in separate hasps and staples;
iii. A combination of a mortise lock and a padlock;
iv. A mortise lock that requires two keys to open; or,
v. A three-point lock.

Note: A five-blade lock also meets requirements. Padlocks shall have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks shall be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Trailers, semi-trailers, and similar vehicular magazines may, for each door, be locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a casehardened shackle of at least ⅜ inch diameter, if the door hinges and lock hasps are securely fastened to the magazine and to the door frame. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

e. Placards. The placards required by Department of Transportation regulations at 49 CFR Part 172, Subpart F, for the transportation of blasting agents shall be displayed on all magazines.

2. Indoor magazines.

a. General. Indoor magazines shall be theft resistant. They need not be weather-resistant if the buildings in which they are stored provide protection from the weather. No indoor magazine shall be located in a residence or dwelling. Indoor magazines containing quantities of blasting agents in excess of 50 pounds are subject to Table of Distance requirements of 527 CMR 13.00.

b. Construction. The doors shall be constructed of wood or metal.

c. Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

d. Locks. Each door shall be equipped with:

i. Two mortise locks;
ii. Two padlocks fastened in separate hasps and staples;
iii. A combination of a mortise lock and a padlock;
iv. A mortise lock that requires two keys to open; or,
v. A three-point lock.

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Note: A five-blade lock also meets requirements. Padlocks shall have at least five tumblers and a case-hardened shackle of at least inch diameter. Padlocks shall be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter, if the door hinges and lock hasps are securely fastened to the magazine and to the door frame. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

13.05: continued

USE OF MAGAZINES

Product Stored	TYPE OF MAGAZINE 1	2	3	4	5
High Explosives (1.1D) (Class A Exp.) Incl. dynamites, cap sensitive emulsions slurries, gels and cast booster	X	X	X		
Black Powder (1.1D) (Class A Exp.) Defined as Low Explosive by BATF for storage	X	X	X	X	
Detonators (1.1B) (Class A Exp.)	X	X	X		
Detonating Cords (1.1D, 1.2D, 1.4G) (Class A or C Exp.)	X	X	X		
Detonators (1.4B, 1.4S) (Class C Exp.)	X	X	X	X	
Safety fuse, elect squibs, igniters and ignitor cord (1.4G, 1.4S)	X	X	X	X	
Blasting Agents (1.5D) (Blasting Agents)	X	X	X	X	X
Propellants (1.3C) (Class B Exp.) Defined as Low Explosive by BATF for storage	X	X	X	X	

Note: Detonators shall not be stored in the same magazine with other explosives

EXCEPTION: Detonators which are not mass detonating may be stored with safety fuse, electric squibs, ignitors or ignitor cord in Type 1, 2, 3, or 4 magazines.

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CLASSIFICATION OF MAGAZINES

Construction Features	Magazine Types				
	1	2	3	4	5
Permanent	X			X	X
Portable/Mobile		X	X	X	X
Bullet-Resistant	X	X			
Fire-Resistant	X	X	X	X[2]	X[2]
Theft-Resistant	X	X	X	X	X[1]
Weather-Resistant	X	X	X	X	X
Ventilated	X	X	X	X[2]	X[2]

Note 1: Each door of a Mobile Type 5 magazine shall be equipped with at least one 5-tumbler padlock having a ⅜ inch case-hardened shackle. The lock need not be hooded.
Note 2: Over-the-road trucks or semi-trailers used for temporary storage as Type 4 or 5 magazines need not be fire-resistant or ventilated.

(3) Tables of Distances.

(a) All explosives, except as herein otherwise provided, shall be stored in a permanent magazine which shall be located as required by the *American Table of Distances for the Storage of Explosives*, as revised and approved by the Institute of Makers of Explosives (June 1991), Table 1, and the *Table of Separation Distance of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents*, Table 2.

(b) The Table regulates the distance a permanent magazine shall be kept from other magazines and from the nearest inhabited building, passenger railway or highway (excepting a vehicular magazine while in transit).

(c) When two or more storage magazines are located on the same property, each magazine shall comply with the minimum distances, specified from inhabited buildings, railways, and highways, and in addition they shall be separated from each other by not less than the distances shown for "Separation of Magazines". If any two or more magazines are separated from each other by less than the specified "Separation of Magazines" distances, then such two or more magazines, as a group, shall be considered as one magazine, and the total quantity of explosives stored in such group shall be treated as if stored in a single magazine located on the site of any magazine of the group, and shall comply with the minimum distances specified from other magazines, inhabited buildings, railways, and highways.

13.05: continued

TABLE 1
American Table of Distances for the Storage of Explosives

The American Table of Distances is reprinted from IME Safety Library Publication No. 2 with permission of the Institute of Makers of Explosives. (revised in June 1991)

Distances in Feet

Quantity of Explosive Materials (1,2),(4)		Inhabited Buildings		Public Highways with Traffic Vol. of less than 3,000 Vehicles /Day		Passenger Railways- Public Highways with Traffic Vol. of more than 3,000 Vehicles/Day		Separation of Magazines (3)	
Pounds Over	Pound Not Over	Barri-caded	Unbarri-caded	Barri-caded	Unbarri-caded	Barri-caded	Unbarri-caded	Barri-caded	Unbarri-caded
0	5	70	140	30	60	51	102	6	12
5	10	90	180	35	70	64	128	8	16
10	20	110	220	45	90	81	162	10	20
20	30	125	250	50	100	93	186	11	22
30	40	140	280	55	110	103	206	12	24
40	50	150	300	60	120	110	220	14	28
50	75	170	340	70	140	127	254	15	30
75	100	190	380	75	150	139	278	16	32
100	125	200	400	80	160	150	300	18	36
125	150	215	430	85	170	159	318	19	38
150	200	235	470	95	190	175	350	21	42
200	250	255	510	105	210	189	378	23	46
250	300	270	540	110	220	201	402	24	48
300	400	295	590	120	240	221	442	27	54
400	500	320	640	130	260	238	476	29	58
500	600	340	680	135	270	253	506	31	62
600	700	355	710	145	290	266	532	32	64
700	800	375	750	150	300	278	556	33	66
800	900	390	780	155	310	289	578	35	70
900	1,000	400	800	160	320	300	600	36	72
1,000	1,200	425	850	165	330	318	636	39	78
1,200	1,400	450	900	170	340	336	672	41	82
1,400	1,600	470	940	175	350	351	702	43	86
1,600	1,800	490	980	180	360	366	732	44	88
1,800	2,000	505	1,010	185	370	378	756	45	90
2,000	2,500	545	1,090	190	380	408	816	49	98
2,500	3,000	580	1,160	195	390	432	864	52	104
3,000	4,000	635	1,270	210	420	474	948	58	116
4,000	5,000	685	1,370	225	450	513	1,026	61	122
5,000	6,000	730	1,460	235	470	546	1,092	65	130
6,000	7,000	770	1,540	245	490	573	1,146	68	136
7,000	8,000	800	1,600	250	500	600	1,200	72	144
8,000	9,000	835	1,670	255	510	624	1,248	75	150
9,000	10,000	865	1,730	260	520	645	1,290	78	156
10,000	12,000	875	1,750	270	540	687	1,374	82	164
12,000	14,000	885	1,770	275	550	723	1,446	87	174
14,000	16,000	900	1,800	280	560	756	1,512	90	180
16,000	18,000	940	1,880	285	570	786	1,572	94	188
18,000	20,000	975	1,950	290	580	813	1,626	98	196
20,000	25,000	1,055	2,000	315	630	876	1,752	105	210
25,000	30,000	1,130	2,000	340	680	933	1,866	112	224
30,000	35,000	1,205	2,000	360	720	981	1,962	119	238
35,000	40,000	1,275	2,000	380	760	1,026	2,000	124	248
40,000	45,000	1,340	2,000	400	800	1,068	2,000	129	258
45,000	50,000	1,400	2,000	420	840	1,104	2,000	135	270
50,000	55,000	1,460	2,000	440	880	1,140	2,000	140	280
55,000	60,000	1,515	2,000	455	910	1,173	2,000	145	290
60,000	65,000	1,565	2,000	470	940	1,206	2,000	150	300
65,000	70,000	1,610	2,000	485	970	1,236	2,000	155	310
70,000	75,000	1,655	2,000	500	1,000	1,263	2,000	160	320
75,000	80,000	1.695	2,000	510	1,020	1,293	2,000	165	330
80,000	85,000	1,730	2,000	520	1,040	1,317	2,000	170	340
85,000	90,000	1,760	2,000	530	1,060	1,344	2,000	175	350
90,000	95,000	1,790	2,000	540	1,080	1,368	2,000	180	360
95,000	100,000	1,815	2,000	545	1,090	1,392	2,000	185	370

13.05: continued

Distances in Feet (continued)

Quantity of Explosive Materials[1,2],[4]		Inhabited Buildings		Public Highways with Traffic Vol. of less than 3,000 Vehicles /Day		Passenger Railways-Public Highways with Traffic Vol. of more than 3,000 Vehicles/Day		Separation of Magazines (3)	
Pounds Over	Pound Not Over	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
100,000	110,000	1,835	2,000	550	1,100	1,437	2,000	195	390
110,000	120,000	1,855	2,000	555	1,110	1,479	2,000	205	410
120,000	130,000	1,875	2,000	560	1,120	1,521	2,000	215	430
130,000	140,000	1,890	2,000	565	1,130	1,557	2,000	225	450
140,000	150,000	1,900	2,000	570	1,140	1,593	2,000	235	470
150,000	160,000	1,935	2,000	580	1,160	1,629	2,000	245	490
160,000	170,000	1,965	2,000	590	1,180	1,662	2,000	255	510
170,000	180,000	1,990	2,000	600	1,200	1,695	2,000	265	530
180,000	190,000	2,010	2,010	605	1,210	1,725	2,000	275	550
190,000	200,000	2,030	2,030	610	1,220	1.755	2,000	285	570
200,000	210,000	2,055	2,055	620	1,240	1,782	2,000	295	590
210,000	230,000	2,100	2,100	635	1,270	1,836	2,000	315	630
230,000	250,000	2,155	2,155	650	1,300	1,890	2,000	335	670
250,000	275,000	2,215	2,215	670	1,340	1,950	2,000	360	720
275,000	300,000	2,275	2,275	690	1,380	2,000	2,000	385	770

Note 1: For quantity and distance purposes, detonating cord of 50 grains per foot shall be calculated as equivalent to eight lbs. of high explosive per 1,000 feet. Heavier or lighter core loads shall be rated proportionately.

Note 2: For quantity and distance purposes, detonators in strengths through No. 8 cap shall be rated at 1½ lbs. of explosives per 1,000 caps. For strengths higher than No. 8 cap, consult the manufacturer.

Note 3: When two or more magazines are located on the same property, each magazine shall comply with the minimum distances specified from inhabited buildings, railways and highways, and, in addition, they shall be separated from each other by not less than the distances shown for "Separation of Magazines," except that the quantity of explosive materials contained in the detonator magazine shall govern in regard to the spacing of said detonator magazines from magazines containing other explosive materials. If two or more magazines are separated from each other by less than the specified "Separation of Magazines" distances, then such two or more magazines, as a group, shall be considered as one magazine, and the total quantity of explosive materials stored in such group shall be treated as if stored in a single magazine located on the site of any magazine of the group, and shall comply with the minimum of distances specified from other magazines, inhabited buildings, railways and highways.

Note 4: This Table applies only to the manufacturer and permanent storage of commercial explosive materials. It is not applicable to transportation of explosives or any handling or temporary storage necessary or incident thereto. It is not intended to apply to bombs, projectiles, or other heavily encased explosives.

Note 5: When a manufacturing building on an explosive materials plant site is designed to contain explosive materials, such building shall be located from inhabited buildings, public highways and passenger railways in accordance with the American Table of Distances based on the maximum quantity of explosive materials permitted to be in the building at one time.

13.05: continued

TABLE 2

American Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents (1,6)

Donor Weight		Minimum Separation Distance of Acceptor when Barricaded (2) feet		Minimum Thickness of Artificial Barricades (5) (in)
Pounds Over	Pounds Not Over	Ammonium Nitrate(3)	Blasting Agent (4)	
	100	3	11	12
100	300	4	14	12
300	600	5	18	12
600	1,000	6	22	12
1,000	1,600	7	25	12
1,600	2,000	8	29	12
2,000	3,000	9	32	15
3,000	4,000	10	36	15
4,000	6,000	11	40	15
6,000	8,000	12	43	20
8,000	10,000	13	47	20
10,000	12,000	14	50	20
12,000	16,000	15	54	25
16,000	20,000	16	58	25
20,000	25,000	18	65	25
25,000	30,000	19	68	30
30,000	35,000	20	72	30
35,000	40,000	21	76	30
40,000	45,000	22	79	35
45,000	50,000	23	83	35
50,000	55,000	24	86	35
55,000	60,000	25	90	35
60,000	70,000	26	94	40
70,000	80,000	28	101	40
80,000	90,000	30	108	40
90,000	100,000	32	115	40
100,000	120,000	34	122	50
120,000	140,000	37	133	50
140,000	160,000	40	144	50
160,000	180,000	44	158	50
180,000	200,000	48	173	50
200,000	220,000	52	187	60
220,000	250,000	56	202	60
250,000	275,000	60	216	60
275,000	300,000	64	230	60

Note 1: Recommended separation distances to prevent explosion of ammonium nitrate and ammonium nitrate-based blasting agents by propagation from nearby stores of high explosives or blasting agents referred to in the Table as the "donor." Ammonium nitrate, by itself, is not considered to be a donor when applying this Table. Ammonium nitrate, ammonium-fuel oil or combinations thereof are acceptors. If stores of ammonium nitrate are located within the sympathetic detonation distance of explosives or blasting agents, ½ the mass of the ammonium nitrate shall be included in the mass of the donor.

13.05: continued

Note 2: When the ammonium nitrate and/or Blasting agent is not barricaded, the distances shown in the Table shall be multiplied by six. These distances allow for the possibility of high velocity metal fragments from mixers, hoppers, truck bodies, sheet metal structures, metal containers, and the like which may enclose the "donor." Where storage is in bullet-resistance magazines recommended for explosives or where the storage is protected by a bullet-resistant wall, distances and barricaded thickness in excess of those prescribed in the American Table of Distances are not required.
Note 3: The distances in the Table apply to ammonium nitrate that passes the insensitivity test prescribed in the definition of ammonium nitrate fertilizer promulgated by the Fertilizer Institute: (Definition and test Procedures for Ammonium Nitrate Fertilizer , May 8, 1971) and ammonium nitrate failing to pass said test shall be stored in separation distances determined by competent persons and approved by the Marshal.
Note 4: These distances apply to blasting agents which pass the insensitivity test prescribed in regulations of the U.S. Department of Transportation and the U.S. Department of the Treasury, Bureau of Alcohol, Tobacco and Firearms.
Note 5: Earth, or sand dikes, or enclosures filled with the prescribed minimum thickness of earth or sand are acceptable artificial barricades. Natural barricades, such as hills or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the "donor" when the trees are bare of leaves, are also acceptable.
Note 6: For determining the distances to be maintained from inhabited buildings, passenger railways, and public highways, use the American Table of Distances for Storage of Explosives Materials.

(4) Storage of Explosives on Water.

(a) No person shall store any explosives on the waters of the Commonwealth unless a permit for such storage has been secured from the State Fire Marshal, and unless the explosives are stored in accordance with the following requirements:

1. Such explosives shall be stored in a magazine located on a boat or vessel used exclusively for the purpose, and such boat or vessel shall be securely moored or anchored according to the direction of the harbor master having jurisdiction. The storage magazines shall be subject to the requirements of 527 CMR 13.05.
2. No detonators shall be stored or transported on a boat or vessel on which any explosives are kept or stored, except in accordance with the applicable provisions of 527 CMR 13.00.
3. No explosives shall be delivered to a boat or vessel or removed therefrom during foggy weather.
4. In the loading or unloading of any explosive, care shall be taken in the handling of same and it shall be so placed or stowed as to prevent displacement during transit.
5. No explosives shall be carried or transported on the waters of the Commonwealth on any vessel which is carrying passengers.
6. Any vessel containing explosives in transit on any of the waters of the Commonwealth shall display on a suitable staff an international Code Flag B (a red flag) readily discernible from a distance of not less than 1,000 feet by day and which shall be properly illuminated at night.
7. No smoking shall be allowed on any vessel containing explosives.
8. All such boats and vessels shall display the word "EXPLOSIVES" in a conspicuous manner so that it may be seen by day from all sides at a distance of not less than 200 feet, and shall be properly illuminated at night.

(b) The requirements of 527 CMR 13.05(4) shall be in addition to applicable U.S. Department of Transportation (U.S. Coast Guard) Regulations, 33 CFR 126 and 46 CFR 194.

(5) Basic Requirements.

(a) Smoking and Open Flames: Smoking, matches, open flames, and spark producing devices shall not be permitted:

1. In any magazine;
2. Within 50 feet of any outdoor magazine; or
3. Within any room containing an indoor magazine.

13.05: continued

(b) Restrictions: For the purpose of licensing and permitting in accordance with 527 CMR 13.00 the capacity of a storage magazine, in pounds, shall be the maximum constructed storage capacity of the magazine as reported to the Federal Bureau of Alcohol Tobacco and Firearms.

1. Magazines: Magazine storage capacities shall not exceed those allowed by the American Table of Distance, regardless of the magazine capacity licensed by M.G.L. c. 148, § 13.

Note: Whenever any Inhabited buildings are erected or new railroad tracks or highways are constructed near a magazine, the permissive capacity of storage magazines shall be reduced to conformity with the *American Table of Distances for the Storage of Explosives*. Whenever the constructed capacity of a magazine is changed, such fact shall be reported to the Marshal in writing without delay.

a. Empty magazines shall be treated as if the magazines were at maximum allowable storage capacity.

b. All types of blasting caps in strength through No. 8, shall be rated at 1½ pounds of explosives per 1,000 caps. The Marshal shall designate the ratings of caps higher in strength than No. 8.

c. Magazines shall be sequentially numbered in minimum two inch block numbers plainly visible on the outside. This number shall correspond to those drawn on a storage facility site diagram, drawn to scale, clearly indicating the separation distances between magazines, inhabited buildings, railways, highways, and other magazines.

d. Magazines shall be plainly posted on the interior side of the magazine door with the current Table of Distance storage capacity.

2. Detonators: Detonators shall not be stored in the same magazine with other explosive materials, except under the following circumstances:

a. In a type 4 magazine, detonators that will not mass detonate may be stored with electric squibs, safety fuse, igniters, and igniter cord.

b. In a type 1 or type 2 magazine, detonators may be stored with delay devices.

c. Explosive materials in excess of 300,000 pounds or detonators in excess of 20 million pieces shall not be stored in one magazine unless approved in writing by the Marshal.

3. Storage within Types 1, 2, 3, and 4 magazines:

a. Explosive materials within a magazine shall not be placed directly against interior walls and shall be stored so as not to interfere with ventilation. To prevent contact of stored explosive materials with walls, a non sparking lattice work or other non sparking material may be used.

b. Containers of explosive materials shall be stored so that marks are visible. Stocks of explosive materials shall be stored so they can be easily counted and checked upon inspection.

Except with respect to fiberboard or other nonmetal containers, containers of explosive materials shall not be unpacked or repackaged inside a magazine or within 50 feet of a magazine, and shall not be unpacked or repackaged close to other explosive materials. Containers of explosive materials shall be closed while being stored.

4. Tools used for opening or closing containers of explosive materials shall be of non sparking materials, except that metal slitters may be used for opening fiberboard containers. Metal tools other than non sparking transfer conveyors shall not be stored in any magazine containing high explosives.

All tools or other implements used in or within ten feet of a magazine shall be of wood, copper, brass or other non sparking material.

5. No person under the age of 18 years shall be employed in or have access to any magazine.

6. Each magazine shall at all times be under the control of a competent person. This shall mean that any penetration of the magazine or magazine area shall be protected by the continuous surveillance of an individual or by an electronic sensing device which shall upon such penetration notify either the head of the police or fire department as the head of the fire department may direct.

13.05: continued

7. All magazines shall be kept in good repair, clean and free from rubbish and empty packages, shall be kept closed and securely locked at all times, and shall be used exclusively for the storage of explosive materials. Oldest stock shall be used first.
8. Upon cessation of the exercise of a license, granted in accordance with M.G.L. c. 148, to store explosive material in a magazine, the holder of said license shall immediately notify the local licensing authority and the head of the fire department in his city, town and the Marshal. The head of the fire department shall ascertain that all hazardous conditions incident to such cessation are eliminated.

(6) Warning Signs: Signs required by 527 CMR 13.05(6) shall be constructed so as to be weather resistant with a reflective surface and conspicuous block lettering at least two inches in height.

(a) The entrance to the magazine area shall be posted with a warning sign with the words: "DANGER -- NEVER FIGHT EXPLOSIVE FIRES -- EXPLOSIVES ARE STORED ON THIS SITE -- CALL (Phone Number).

(b) All approaches to magazine areas shall be adequately posted with warning signs with the words: "DANGER -- KEEP AWAY". Signs shall be so located as to prevent bullets fired at the words into the signs from passing on into the magazine or in the direction thereof.

(7) Housekeeping: Magazines shall be kept clean, dry, and free of grit, paper, empty packages and containers, and rubbish. Floors shall be regularly swept. Brooms and other utensils used in the cleaning and maintenance of magazines shall have no spark producing metal parts, and may be kept in magazines. Floors stained by leakage from explosive materials shall be cleaned according to instructions of the explosives manufacturer. When any explosive material has deteriorated it shall be destroyed in accordance with the advice or instructions of the manufacturer. The area surrounding magazines shall be kept clear of rubbish, brush, dry grass, or trees (except live trees more than ten feet tall), for not less than 25 feet in all directions. Volatile materials shall be kept a distance of not less than 50 feet from outdoor magazines. Living foliage which is used to stabilize the earthen covering of a magazine need not be removed.

(8) Repair of Magazines: Before repairing the interior of magazines, all explosive materials shall be removed and the interior cleaned. Before repairing the exterior of magazines, all explosive materials shall be removed if there exists any possibility that repairs may produce sparks or flame. Explosive materials removed from magazines under repair shall be:

(a) Placed in other magazines appropriate for the storage of those explosive materials under 527 CMR 13.00, or

(b) Placed a safe distance from the magazines under repair where they shall be properly guarded and protected until the repairs have been completed.

(9) Lighting: Electric lighting used in any explosives storage magazine shall meet the standards prescribed by 527 CMR 12.00, the "Massachusetts Electrical Code," for the conditions present in the magazine at any time. All electrical switches shall be located outside of the magazine and shall also meet the standards prescribed by 527 CMR 12.00.

(a) Battery-activated safety lights or battery activated safety lanterns may be used in explosives storage magazines.

(b) Copies of invoices, work orders or similar documents which indicate the lighting complies with 527 CMR 12.00 shall be available for inspection by the head of the local fire department, the Marshal or their designees.

(10) Firefighting: No attempt shall be made to fight a fire that cannot be contained or controlled before it reaches explosive materials. In such cases, all personnel shall be immediately evacuated to a safe location, and the area shall be guarded from entry by spectators or intruders.

The local fire department and other emergency response agencies shall be notified of the location of all magazines and shall be notified of any changes in the location a magazine.

13.05: continued

(11) Operational Procedure Manual: A Magazine Facility Operational Procedure Manual shall be maintained on the storage facility which shall include the following: facility emergency policy and procedures, administrative and emergency notification procedures, scaled plot plan of the storage facility site, showing magazines, inhabited buildings railways and highways within 2,000 feet of the closest magazine, Explosive Material Manufacturers Safety Data Sheets (MSDS) for all explosive materials and SARA Title III Hazardous Materials on the site. This manual shall be kept current and a copy provided upon request to the head of the local fire department and the Marshal or their designees.
Note: a magazine facility containing 10,000 or less pounds of explosive materials shall be exempt from this requirement.

(12) Equivalent Alternate Construction Standards: Alternate storage facilities for explosive materials may be approved by the Marshal when it is shown that such alternate facilities are or will be constructed in a manner substantially equivalent to the standards of construction contained in 527 CMR 13.00 and such construction has been approved by 27 CFR 201(b).

(13) Magazine Alteration: No alteration changing the constructed storage capacity of a magazine shall be made without notifying the Marshal and the head of the local fire department in writing and then receiving written acknowledgment of receipt of the notification from the head of the local fire department or the Marshal.

13.06: Transportation

(1) Basic Requirements.

(a) In addition to all applicable requirements of this regulation, intrastate transportation of explosive materials shall comply with the Hazardous Materials Regulations of the U.S. Department of Transportation, 49 CFR 100-179, and Federal Motor Carrier Safety Regulations, 49 CFR 387-397.

(b) 527 CMR 13.06 shall not apply to the transportation of small arms ammunition and components.

(c) Explosive materials shall not be transported through any prohibited vehicular tunnel or subway or over any prohibited bridge, roadway, or elevated highway .

(d) No person shall smoke, carry matches or any other flame-producing device, or carry unauthorized firearms or cartridges while transporting explosive materials.

(e) No person shall drive, load, or unload a motor vehicle transporting explosive materials in a careless or reckless manner.

(f) Explosive materials shall not be carried or transported in or upon a public conveyance or vehicle carrying passengers for hire.

(g) In the event of breakdown or collision, the head of the local fire department and the police authority having jurisdiction shall be promptly notified.

1. Explosive materials shall be transferred from the disabled vehicle to another under the supervision of a person qualified by the owner of the explosive material or at the direction of a police officer, fire officer or the Marshal.

2. Motor vehicles transporting explosives shall not be towed while containing explosive materials unless directed by a police officer, fire officer or the Marshal.

(h) Detonators: No detonating primer may be transported on the same motor vehicle with any Division 1.1, 1.2, or 1.3 (Class A or Class B) explosive material (except other detonating primers or detonators) blasting agent or detonating cord, Division 1.4, (Class C) explosive material. No detonator shall be transported on the same motor vehicle with any Division 1.1, 1.2, or 1.3, (Class A or Class B) explosive material (except other detonators or detonating primers), blasting agent or detonating cord, Division 1.4, (Class C) explosive material unless;

1. It is packed in a U.S. Department of Transportation specification container MC 201, (49 CFR 178.318), or an Institute of Makers of Explosives (IME) Standard Container described in Safety Library Publication 22, or

2. The packaging conforms with requirements prescribed in U.S. Department of Transportation Regulation 49 CFR 173.103(d), and its use is restricted to instances when:

13.06: continued

a. There is no Division 1.1, 1.2, or 1.3 (Class A or Class B) explosive material or blasting agent loaded on the motor vehicle; and

b. A separation of 24 inches is maintained between each package of detonators and each package of detonating cord, or

3. It is packaged and loaded in accordance with a method approved by the U.S. Department of Transportation. One method approved by the Department is as follows:

The detonators shall be in prescribed packages which in turn are loaded into suitable containers or separate compartments. Both the detonators and the container or the compartment shall meet the requirements of the Institute of Makers of Explosives Standard (IME) standard container described in Safety Library Publication 22.

(2) Transportation Vehicles.

(a) Vehicles used for transporting explosive materials shall be capable of carrying the load and shall be in good mechanical condition.

(b) When explosive materials are transported on a vehicle with an open body, a portable magazine, securely fastened to the vehicle body, shall be used to store the explosive materials.

(c) Vehicles used for transporting explosive materials shall have no exposed spark-producing surface on the inside of the magazine body.

EXCEPTION: Transportation of bulk explosive materials may be exempted by written authority of the U.S. Department of Transportation.

(d) Magazines when transporting explosive materials shall be kept locked.

(e) Floors of transportation vehicles shall be tight.

(f) Motor vehicles used for transporting any quantity of explosive materials on highways shall display all placards, lettering, or numbering required by the U.S. Department of Transportation.

(g) Each motor vehicle used for transporting explosive materials shall be equipped with fire extinguishers according to the following schedule:

1. Trucks—Gross Vehicle Weight (GVW) less than 14,000 lbs At least two extinguishers having combined capacity of 4-A:20-B, C.

2. Trucks—GVW 14,000 lbs or greater; tractor or semi-trailer units At least two extinguishers having combined capacity of 4-A:70-B, C.

(h) Only listed fire extinguishers shall be used. Fire extinguishers shall be designed, constructed, and maintained to permit visual determination of whether they are fully charged.

(i) Extinguishers shall be located where they will be accessible for immediate use.

(j) Extinguishers shall be examined and recharged periodically according to manufacturers recommendations.

(k) Where motor vehicles are operated in temperatures below 0°F, dry chemical extinguishers shall be pressurized with nitrogen.

(l) A motor vehicle used for transporting explosive materials shall be inspected to determine that it is in proper condition. The following items shall be checked:

1. Fire extinguishers filled and in working order.
2. All electrical wiring completely protected and securely fastened to prevent short-circuiting.
3. Chassis, motor, oil pan, and body undersides reasonably clean and free of excess oil and grease.
4. Fuel tank and fuel lines secure and not leaking.
5. Brakes, lights, horn, windshield wipers, and steering apparatus functioning properly.
6. Tires inflated properly and free of defects.
7. Vehicle in proper condition in every other respect and acceptable for handling explosive materials.

(3) Operation of Transportation Vehicles.

(a) Vehicles transporting explosive materials shall only be driven by and be under the control of a properly licensed driver who is physically fit, careful, capable, reliable, able to read and write the English language, and not addicted to the use of, or under the influence of, intoxicants, narcotics, or other dangerous drugs.

13.06: continued

(b) The driver of a vehicle transporting explosive materials on highways shall be not less than 21 years old. The driver shall be familiar with traffic regulations, applicable federal and state regulations concerning the transportation of explosive materials, and the provisions of 527 CMR 13.00.

(c) No vehicle transporting explosive materials shall be parked before reaching its destination, even though attended, on any highway adjacent to or in proximity to any bridge, tunnel, dwelling, building, or place where people work, congregate, or assemble.

Note: This requirement does not apply under emergency conditions or as directed by the Marshal, the head of the local fire department, the head of the local police department or their designees.

(d) Every motor vehicle transporting any quantity of explosives shall, at all times, be attended by a driver or other qualified representative of the motor carrier operating the vehicle. This attendant shall have been made aware of the class of the explosive in the vehicle and its inherent dangers, and shall have been instructed in the procedures to be followed in order to protect the public from those dangers. The attendant shall be familiar with the operation of the vehicle, shall be trained to handle the explosive material on board the vehicle, and shall be authorized to remove the explosive material from the vehicle when required.

(e) For the purpose of 527 CMR 13.00, a motor vehicle shall be considered "attended" only when the driver or attendant is physically on or in the vehicle or has the vehicle within his or her field of vision and can reach it quickly and with no interference. "Attended" also means that the driver or attendant is awake, alert, and not engaged in other duties or activities that may divert attention from the vehicle.

Note: Necessary communication with public officers or representatives of the shipper, carrier, or consignee and necessary absence from the vehicle to obtain food or provide for physical comfort does not violate this requirement if such communication or absence complies with U.S. Department of Transportation regulations.

(f) A vehicle carrying explosive materials may be left unattended if parked in an area where such parking is authorized by a storage license or a permit issued by the head of the fire department.

(g) No spark-producing metal or tools, oils, matches, firearms, electric storage batteries, flammable materials, acids, oxidizers, or corrosives shall be carried in the body of any motor vehicle transporting explosive materials.

Note: Exception if allowed by the U.S. Department of Transportation Hazardous Materials Regulations.

(h) Vehicles transporting explosive materials shall avoid congested areas and heavy traffic. If requested by the head of the local fire department, persons transporting explosives shall provide anticipated routes of travel. Where routes through congested areas have been specifically designated by the head of the local fire department such routes shall be followed.

(i) Delivery of explosives shall only be made to persons displaying proper permits and licenses and shall be delivered into magazines or temporary storage or handling areas as authorized by 527 CMR 13.00. No person shall deliver explosive materials to any magazine, building or structure that is not permitted by the Marshal in accordance with 527 CMR 13.04(3)(b). Any person who so delivers such explosive materials shall keep a record of the delivery transaction in accordance with 527 CMR 13.12(3)(a). Said record shall contain the permit number assigned by the Marshal to the magazine, building or structure where said materials are to be stored. The Marshal may suspend or revoke any certificate or permit issued by the Marshal under the provisions of 527 CMR 13.00 for any person who does not comply with the provisions of 527 CMR 13.06(3)(i).

(j) Tires shall be checked for proper inflation and general condition after each two hours or 100 miles of travel, whichever occurs first, and at every rest stop. Flat or overheated tires shall be removed from the vehicle immediately. After removal the tire shall be placed far enough from the vehicle so that a spontaneous ignition of the tire will not endanger the vehicle or its cargo. The tire shall not be replaced on the vehicle until it has been cooled below the danger of ignition nor shall it be used until the problem has been corrected.

(4) Underground Transportation of Explosives.

(a) All explosive materials in transit underground shall be taken to the place of use or storage without delay.

13.06: continued

(b) The quantity of explosive material taken to an underground loading area shall not exceed the amount estimated by the blaster in charge to be necessary for the blast.
(c) Explosive material in transit shall not be left unattended.
(d) The hoist operator shall be notified before explosives or blasting agents are transported in a shaft conveyance.
(e) Vehicles used for the transportation of explosive material underground shall have the electrical system checked weekly to detect any failures which may constitute an electrical hazard. A certification record shall be kept which includes the date of the inspection; the signature of the person who performed the inspection; and a serial number, or other identifier, of the vehicle inspected.
(f) The installation of auxiliary lights on vehicle beds which are powered by the truck's electrical system shall be prohibited.
(g) Explosive materials shall be hoisted, lowered or conveyed in a powder car. No other materials, supplies or equipment shall be transported in the same conveyance at the same time. No one except the operator, his helper, and the powder man shall ride on this powder car.
(h) No explosive material shall be transported on any locomotive. At least two car lengths shall separate the locomotive from the powder car.
(i) No explosive materials shall be transported on a man haul.
(j) Compartments for transporting detonators and explosives in the same car or conveyance shall be physically separated by a distance of 24 inches or by a solid partition of at least six inches.

13.07: Explosive Materials Mixing

(1) Blasting Agents:
(a) The requirements of 527 CMR 13.07 shall not apply to slurry, emulsion and water gel explosive materials.
(b) Fixed Location Mixing. Buildings or other facilities used for the mixing of blasting agents shall conform to the following requirements, unless other requirements are specifically mandated by the Marshal, the head of the local fire department or their designees:
1. The exterior shall be constructed of non-combustible materials.
2. Floors shall be of concrete or other non-absorbent material. They shall have no drains or piping into which molten materials could flow and be confined during a fire.
3. All liquid fuel storage facilities, including fuel oil, shall be separated from the mixing building, and located in such a manner that in case of tank rupture the liquid will drain away from the mixing building; or diked in a manner to contain the tank contents in case of rupture.
4. Only heating units which do not depend on combustion processes, properly designed and located, may be used in the plant. Electric heaters with exposed resistance elements shall be prohibited. All combustion sources of heat shall be provided from units located outside the mixing plant.
5. All internal-combustion engines, such as diesel or gasoline-powered generators, shall be located outside the mixing plant, or shall be properly ventilated and isolated by a permanent firewall. The exhaust systems on all such engines shall be provided with spark-arrested mufflers, or be remotely located, so that any spark emission will not be a hazard to any materials in or adjacent to the plant.

(c) Equipment Used for Mixing.
1. The design of the processing equipment, including mixing and conveying equipment, shall be compatible with the relative sensitivity of the materials being handled. Equipment shall be designed to minimize the possibility of frictional heating, compaction, overloading, accumulation of dust, and confinement. All surfaces shall be accessible for cleaning. All hollow shafts shall be constructed to permit venting with an opening of at least ½ inch diameter.
2. Means shall be provided to prevent the flow of fuel to the mixer in case of fire. In gravity flow systems, an automatic spring-loaded shut-off valve with fusible link shall be installed.

(d) Mix Plant Operation.
1. The mixing, loading, and ingredient transfer areas where residues or spilled materials may accumulate shall be cleaned periodically. A cleaning and collection system for dangerous residues shall be provided.

13.07: continued

2. A daily visual inspection shall be made of the mixing, conveying and electrical equipment to determine that such equipment is in good operating condition A program of systematic maintenance shall be conducted on a regular schedule.
3. The entire mixing and packaging plant shall be cleaned regularly and thoroughly to prevent excessive accumulation of dust, grease, and product ingredients.
4. Smoking, matches, flame-producing devices, open flames and firearms or cartridges shall not be permitted inside of, or within 50 feet of, any building used for the mixing of blasting agents.
5. Empty ingredient bags shall be disposed of daily in a safe manner.
6. No welding shall be permitted nor open flames allowed in or around the mixing or storage area of the plant, unless the equipment and area have been completely washed down and all fuels and oxidizing material removed.
7. Before welding or making repairs to hollow shafts, all fuels and oxidizing material shall be removed from the outside and inside of the shaft by a thorough washing, and the shaft shall be vented.
8. Other explosive materials shall not be stored in any building used for the mixing of blasting agents.

(e) Construction of Bulk Delivery and Mixing Vehicles.
1. The body of each vehicle used for the bulk delivery and mixing of blasting agents shall be constructed of noncombustible materials.
2. All moving parts of the mixing system shall be designed so as to prevent heat build-up. Shafts or axles which contact the product shall have outboard bearings .
3. Bulk mix delivery equipment shall be strong enough to carry the load without difficulty and be in good mechanical condition
4. When electric power is supplied by a self-contained motor generator located on the vehicle, the motor generator shall be separated from the blasting agent discharge.
5. Processing equipment shall conform to the provisions of 527 CMR 13.07(1)(c).
6. A positive action parking brake which will set the wheel brakes on at least one axle shall be provided on vehicles equipped with air brakes and shall be used during bulk delivery operations. Wheel chocks shall supplement parking brakes.

(f) Blasting Site Operation of Bulk Delivery and Mixing Vehicles.
1. Motor vehicles transporting blasting agents shall be driven by a properly licensed driver not less than 21 years of age. The driver shall be physically fit, careful, capable, reliable. and able to read and write the English language. The driver shall be familiar with applicable local, state, and federal laws and regulations governing the transportation of explosive materials to the location and on the site.
2. The driver shall not be an unlawful user of or addicted to alcohol, narcotics, or dangerous drugs.
3. The driver shall be trained in the safe operation of the vehicle, together with its mixing, conveying, and related equipment. He shall be familiar with the product being delivered and the general procedure for handling emergency situations.
4. No one shall be permitted to ride on, or load or unload, a vehicle containing blasting agents while under the influence of intoxicants, narcotics, or dangerous drugs.
5. No person shall smoke, carry matches or any other flame-producing device, or carry any firearms while in or near bulk vehicles effecting the mixing, transfer or down-the-hole loading of blasting agents at or near the blast site .
6. Caution shall be exercised in the movement of the motor vehicle at the blast site to avoid driving the vehicle over or dragging hoses over firing lines, detonator wires or tubes, or explosive materials.
7. No in-transit mixing of blasting agents shall be performed.

(g) Repairs to Bulk Delivery and Mixing Vehicles.
1. No welding or open flames shall be used on or around any part of a bulk delivery vehicle until all oxidizing materials and blasting agents have been removed and the equipment has been completely washed down.
2. Before welding or making repairs to hollow shafts, all fuel and oxidizing material shall be removed from the outside and inside of the shaft by a thorough washing, and the shaft shall be vented with a minimum ½ inch diameter opening.

(2) Slurry, Emulsion and Water Gel Explosive Materials.
(a) The following requirements shall apply to the manufacture of slurry, emulsion and water gel, explosive materials.

13.07: continued

(b) Basic Requirements. Handling and processing procedures shall prevent the explosive materials, or their liquid ingredients, from drying out or otherwise losing their liquid or water content.

(c) Fixed Location Mixing.

1. The exterior of mixing buildings shall be of noncombustible construction.

2. Floors shall be of concrete or other nonabsorbent material. They shall have no drains to piping into which molten materials could flow and be confined during a fire.

3. All liquid fuel storage facilities. including fuel oil, shall be separated from the mixing building and located in such a manner that in case of tank rupture, the liquid will drain away from the mixing plant; or be diked in a manner to contain the tank contents in case of rupture.

4. Mixing buildings shall be ventilated to prevent harmful exposure to fumes or dusts.

5. Only heating units which do not depend on combustion processes, properly designed and located, shall be used in the plant. Electric heaters with exposed resistance elements shall be prohibited. All combustion sources of heat shall be provided from units located outside the manufacturing building.

6. Spills or leaks of oxidizer salt solution which may contaminate combustible materials shall be cleaned up immediately.

7. Metal powders such as aluminum shall be kept dry and shall be stored in containers or bins which are moisture-resistant or weather tight. Solid fuels shall be handled in such manner as to prevent dust explosion hazards.

8. Oxidizers and fuels shall be stored in separate buildings or in such a manner that intermixing will not occur in the event of spills.

9. The design of the processing equipment. including mixing and conveying equipment, shall be compatible with the relative sensitivity of the materials being handled. Equipment shall be designed to minimize the possibility of frictional heating. compaction. overloading, and confinement.

(d) Construction of Bulk Delivery and Mixing Vehicles.

1. Motor vehicles used over highways for the bulk transportation of slurry, emulsion and water gel explosive materials or ingredients used in their formulation, shall meet the requirements of 527 CMR 13.06: *Transportation*.

2. Processing equipment shall conform to the requirements of 527 CMR 13.07(2)(c).

3. A positive action parking brake which will set the wheel brakes on at least one axle shall be provided on motor vehicles equipped with air brakes and shall be used during bulk delivery operations. Wheel chocks shall supplement parking brakes.

4. Pressure relief valves shall be installed on containers of ingredients that may produce pressures under confinement. The valve discharge shall be directed so as to prevent harm to personnel in the vicinity of the motor vehicle in the event of over pressurization.

5. Liquid ingredient tanks shall be constructed to dampen movements of contents during transportation if such movements could cause a loss of motor vehicle control or any other hazardous condition.

(e) Blasting Site Operation of Bulk Delivery and Mixing Vehicles.

1. Motor vehicles transporting slurry, emulsion and water gel, explosive materials or ingredients for the formulation, shall be driven by a properly licensed driver not less than 21 years of age. The driver shall be physically fit, careful, capable, reliable, and able to read the English language. The driver shall be familiar with applicable local, state, and federal laws and regulations governing the transportation of explosive materials, or ingredients for their formulation, to the location and on the site.

2. The driver shall not be an unlawful user of or addicted to alcohol, narcotics or dangerous drugs.

3. The driver shall be trained in the safe operation of the motor vehicle together with its mixing, conveying, and related equipment. He shall be familiar with the product being delivered and the general procedure for handling emergency situations.

4. No one shall be permitted to ride on, or load or unload, a motor vehicle containing explosive materials, or ingredients for their formulation, while under the influence of intoxicants, narcotics, or dangerous drugs.

13.07: continued

5. No person shall smoke, carry matches or any other flame-producing device, or carry any firearms while in or near motor vehicles effecting the mixing, transfer, or down-the-hole loading of explosive materials.
6. Caution shall be exercised in the movement of the motor vehicle over or dragging hoses over firing lines, detonator wires or tubes, or explosive materials.
7. No in-transit mixing of explosive materials shall be performed.

13.08: Plosophoric Materials (Binary Explosive Material)

(1) Storage.
(a) Plosophoric components shall be stored in separate locked containers. If any component possesses a hazard classification, it shall be stored in a location and manner appropriate to its hazard class.
(b) Plosophoric materials may be stored in the same magazine with explosive materials, provided their total weight is included in the weight of explosives permitted in the magazine so as to comply with the quantity-distance requirements of the American Table of Distances. Storage shall not introduce a hazard due to chemical incompatibility.

(2) Use.
(a) When plosophoric materials are mixed or combined at the point of use, the procedures recommended by the manufacturer shall be strictly followed.
(b) Since the mixing or combining of plosophoric components produces an explosive material the number of packages combined at any one time shall be limited to the number needed for immediate use.
Note: This requirement may be waived if the extra explosive material produced can be handled and stored as such.
(c) Mixed or combined plosophoric materials shall be transported, stored, and used in the same manner as explosives.
(d) For transportation and storage, individual packages of each plosophoric component shall be packaged in separate shipping containers, in compliance with U.S. Department of Transportation Hazardous Materials Regulations.

13.09: Use of Explosive Materials (Blasting)

(1) Basic Requirements.
(a) All state, and local laws and regulations applicable to obtaining, keeping, transporting, storing, handling, and using explosive materials shall be followed. The purpose of 527 CMR 13.09 also provides for the establishment of limits on the permissible levels of blasting effects to reasonably assure that blasting does not cause injury, or damage outside the blast area.
(b) Explosive materials shall be protected from unauthorized possession and shall not be abandoned.
(c) Explosive materials shall be used under the control of experienced blasters who are familiar with the hazards involved and who hold all required licenses, permits, certificates and authorizations.
1. Loading shall be performed or supervised by a blaster possessing a current Certificate of Competency.
a. No blasting operation shall be conducted at any time unless a blaster holding a Certificate of Competency shall be physically present to direct, supervise and be responsible for such blasting operation.
b. Trainees, helpers, and other persons shall work only under the supervision of a blaster holding a Certificate of Competency.
2. No boreholes shall be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives and excess blasting caps shall be immediately returned to their separate storage magazines.
3. Stemming shall consist of clean fine clay, sand or crushed rock. The use of leaves or trash is prohibited. Each blast hole shall be stemmed to the collar and provide sufficient confinement of the charge to minimize the chance of injury to personnel from flying material.

13.09: continued

4. No person shall buy, receive, accept delivery, keep or store, any explosive material unless he possesses storage facilities as required by 527 CMR 13.00.

a. The provisions of 527 CMR 13.00 as they apply to job site magazines may be waived if delivery is made from an approved magazine or a U.S. Department of Transportation approved container direct to a blast site for immediate placement in previously prepared boreholes and further provided that the explosives shall be detonated in their entirety prior to sunset of the day of delivery, or removed from the site.

b. All storage magazines, when containing explosive materials, shall be locked and safeguarded against theft or tampering.

(d) No explosive materials shall be located, kept or stored where they may be exposed to flame, excessive heat, sparks, impact or theft.

1. No firearms shall be discharged into or in the vicinity of a vehicle containing explosive materials or into or in the vicinity of a location where explosive materials are being handled, used, or stored.

2. No smoking shall be permitted within 50 feet of any location where explosives are being handled or used.

3. No person within 50 feet of any location where explosives are being handled or used shall carry any matches, open light, or other fire or flame.

Note: Suitable devices for lighting safety fuse are exempt from this requirement.

(e) No person under the influence of intoxicating liquors, narcotics, or other dangerous drugs shall be allowed to handle explosive materials.

(f) No attempt shall be made to fight a fire that cannot be contained or controlled before it reaches explosive materials. In such cases the local fire department shall be immediately notified, all personnel shall be immediately evacuated to a safe location, and the site guarded from entry by spectators or intruders until the arrival of the head of the fire department or his designee.

(g) Unauthorized or unnecessary personnel shall not be present where explosive materials are being handled, used, or stored.

(h) Explosive materials shall be kept in properly marked closed containers or packages while being transported between the storage magazine and the blasting site.

Note: Partial reels of detonating cord need not be in closed containers, unless transported over highways.

(i) Containers of explosive materials shall not be opened in any magazine or within 50 feet of any magazine.

Non sparking tools shall be used for opening any package or container of explosive materials.

Note: Metal slitters may be used for opening fiberboard containers

(j) Explosive material shall not be used in a manner contrary to the instructions of the manufacturer of the explosive materials.

(k) Blast Analysis: Before conducting a blast the blaster shall conduct a blast analysis of the overall factors affecting the blasting operations. This analysis shall consider; adjacent area structure(s), building(s), building foundations, utilities, including gas and water supply lines, septic systems and swimming pools, and area geology within 250 feet of the center of the blast site and the identification of commercial equipment such as computers, electron microscopes, laser equipment, relays etc., which are sensitive to vibrations, and other underground objects that might be damaged by the effects of a blast.

1. A blast analysis shall be compared to the blast design plan [described in 527 CMR 13.09(1)(l)] to establish a sound relationships between the blast design and the effects of blasting upon the neighborhood within the blast area. The blast analysis shall contain a discussion of plan factors to be used which protect the public and meet the applicable airblast, flyrock, and ground vibration standards of 527 CMR 13.00.

2. The area of the blast analysis shall be within 250 feet from the closest borehole.

(l) Blast Design Plan: When blasting is done in a congested area or within 250 feet of a building, structure, railway, or highway, or any other installation that may be affected, precautions shall be taken by the blaster in the design of the blast plan to prevent damage and to minimize adverse effects including ground vibrations, air blast and flyrock.

1. Such precautions shall include but not be limited to, review of each shot variable or dimension to ensure a blast design plan which establishes sound relationships between current industry standards and the allowable limits of the effects of blasting.

13.09: continued

2. A blast design plan shall describe as a minimum, the amount of material to be removed, benches and lifts, sketches of proposed drill patterns, spacings, free face, borehole size, depth, and angle, stemming, decking, weight of explosive material per delay, delay periods, initiation techniques, the amount of explosive material to be used, critical dimensions, location and descriptions of building(s) and structure(s) to be protected, their number, and the placement of seismographs.

a. All shots shall be designed using the most current industry standards, to prevent excessive air blast, ground vibration, and flyrock.

b. Blasting mats shall be required if the material to be blasted lies within 100 feet of a highway, an inhabited building or structure not under the control of the project.

Note: The requirement of 527 CMR 13.09(1)(k) and (l) shall not affect the issuance of a Use and Handling permit.

(m) A blaster authorized to prepare explosive charges or to conduct blasting operations shall use every reasonable precaution, including but not limited to warning signals, flags, barricades, or other equally effective means to ensure the safety of the general public and workers.

1. A code of blasting signals shall be posted on one or more conspicuous places at the operation. All employees shall be required to familiarized themselves with this code. The code shall be:

WARNING SIGNAL: Three long blasts five minutes prior to blast signal.
BLAST SIGNAL: Two blasts one minute prior to the shot.

2. Blast signals shall be clearly audible for a distance of 250 feet of the blast site.

ALL CLEAR SIGNAL: A prolonged blast following the inspection of the blast area.

(n) No person shall fire a blast in any blasting operation on Sunday or between the hours of sunset and sunrise unless otherwise authorized in writing by the Marshal or the head of the local fire department, but in any case the authority of the Marshal shall prevail.

(o) Whenever blasting is being conducted in the vicinity of utility lines or rights-of-way, the blaster shall notify the appropriate representatives of the utilities at least 24 hours in advance of blasting, specifying the location and intended time of such blasting. A Dig-Safe number shall be obtained,

Note: This time limit may be waived by the head of the local fire department or the Marshal.

(p) Precautions shall be taken to prevent accidental discharge of electric detonators from currents induced by radar and radio transmitters, lightning, adjacent power lines, dust and snow storms, or other sources of extraneous electricity. These precautions shall include:

1. The posting of signs warning against the use of radio transmitters on all roads within 500 feet and not less than 100 feet of blasting operations.

BLASTING ZONE	TURN OFF 2-WAY RADIO
About 48" x 48"	About 42" x 36"

Specimens of signs which would meet the requirements of 527 CMR 13.09(1).

2. Observance of the latest recommendations with regard to blasting in the vicinity of radio transmitters or power lines, as set forth in IME Safety Library Publication No. 20, *Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Commercial Electric Detonators (Blasting Caps)*.

3. Surface and underground use, and all handling of explosive materials shall be discontinued during the approach and progress of an electrical storm. All personnel shall move to a safe location.

Consideration shall be given to the fact that lightning has been known to follow steel, piping, and conductive ore.

(2) Blasting Operations.

(a) During the time that boreholes are being loaded or are loaded with explosive materials, blasting agents, or detonators, the blast site shall be barred to all but those persons engaged in the drilling and loading operations or otherwise authorized to enter the site.

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(b) Boreholes shall be large enough to permit free insertion of cartridges of explosive materials. Boreholes shall not be collared in bootlegs or in holes that have previously contained explosive materials. Holes shall not be drilled where there is a danger of intersecting another hole containing explosive material.

(c) All boreholes shall be inspected and cleared of any obstruction before loading.

(d) Pneumatic loading of blasting agents into boreholes primed with electric detonators or other static sensitive initiation systems shall comply with the following requirements:

1. A positive grounding device shall be used for the equipment to prevent accumulation of static electricity.
2. A semi-conductive discharge hose shall be used.
3. A qualified person shall evaluate all systems to assure that they will adequately dissipate static charges under field conditions.

(e) Tamping shall be done only with wooden rods or approved plastic poles having no exposed metal parts.

Note: Non sparking metal connectors may be used on jointed tamping pole.

1. Violent tamping shall be avoided.
2. The primer shall never be tamped.

(f) After loading boreholes for a blast is completed and before firing, all excess explosive materials shall be removed from the area and returned to the proper storage facilities.

(g) As soon as practical after all boreholes are connected, prior to connecting to a source of initiation such as a blasting machine and until the shot has been fired and subjected to post-blast examination, the blast area shall be guarded or barricaded and posted.

(3) Initiating Blasts.

(a) The blaster shall establish the boundaries of the blast site and secure the blast area prior to firing the blast.

(b) Cap and fuse shall not be used to initiate blasts in congested areas or on or adjacent to highways open to traffic.

When safety fuse is used, the burning rate shall be determined and in no case shall fuse lengths less than 120 seconds be used. The detonator shall be securely attached to the fuse with a standard ring-type cap crimper.

(c) When electric detonators are used, stray current tests shall be made as frequently as necessary. Maximum stray current shall not exceed 0.05 amperes through a 1-ohm resistor, measured at the blast site. Non-electric initiating systems shall be used unless corrective action is taken to reduce the stray current below the limits indicated in 527 CMR 13.09(3)(c).

(d) Electric detonators of different brands shall not be used in the same firing circuit.

1. Electric detonators shall be fired within the firing currents in the range recommended by the manufacturer.
2. The firing circuit shall be completely insulated from ground or other conductors.
3. Aluminum wire shall not be used in blasting circuits.
4. No damaged leading or connecting wire shall be used in any blasting circuits.
5. All wire ends shall be clean before connecting.

(e) All electric blasting circuits and other initiating systems whose continuity can be tested (such as gas detonator initiating systems) shall be tested with a blasting galvanometer or other blast continuity test instrument, as appropriate, that has been designed and approved for the purpose. All electrically initiated blasts shall be made by using blasting machines suitable for the circuitry being fired.

(f) No detonator shall be inserted in explosive materials that do not have a cap well without first making a hole in the cartridge with a proper size suitable non sparking tool made for the purpose.

1. Primers shall not be assembled closer than 50 feet from any magazine. Primers shall be made up only when and as required for immediate needs.
2. Adequate priming shall be used. If any uncertainty exists about the amount of priming necessary, the manufacturer shall be consulted.
3. Primers shall be made up only at the time of use and as close to the blast site as conditions allow.
4. When using non-electric initiation systems:
    a. The selection of the initiation system and the design of the blast shall be under the supervision of the blaster in charge;

13.09: continued

b. The initiation system shall be used in accordance with the manufacturer's instructions;

c. The blaster in charge shall conduct a visual check after blast hookup;

d. When using a system that can be tested for continuity, the blast layout shall be tested for continuity as recommended by the manufacturer; and

e. Where judged to be necessary by the blaster in charge, a double trunkline or closed-loop hookup shall be used.

(g) Only the blaster in charge shall fire the blast. All connections shall be made progressively from the borehole back to the initiation point. Blasting lead lines shall remain shunted (shorted) and shall not be connected to the blasting machine or other source of current until the blast is to be fired.

(h) No blast shall be fired until the blaster in charge has made certain that all surplus explosive materials are in a safe place, all persons and equipment are at a safe distance or under sufficient cover, and that an adequate warning signal has been given.

1. No blast shall be fired without a positive signal from the blaster in charge.

2. Adequate warning shall be given to all personnel in proximity to the blast site at least five minutes in advance of each blast.

(4) Procedures After Blasting.

(a) No person shall return to the blast area until permitted to do so by the blaster.

(b) The blaster shall allow sufficient time for smoke and fumes to dissipate and for dust to settle before returning to the blast site.

(c) The blaster shall inspect the entire blast site for misfires before allowing other personnel to return to the blast area.

(5) Misfires.

(a) If a misfire is found, the blaster shall provide safeguards for excluding all personnel from the blast area.

(b) No other work shall be done other than that necessary to remove the hazard. Only those persons necessary to do this work shall remain at the blast site.

(c) No attempt shall be made to extract explosive materials from a misfired hole. A new primer shall be inserted, and the hole shall be re-blasted.

Note: If re-blasting presents a hazard, the explosive materials may be washed out with water, or, where the misfire is under water, blown out with air.

(d) If there are any misfires using cap and fuse, all personnel shall stay out of the blast site for at least 30 minutes.

(e) If there are any misfires using other non electric detonators (*i.e.*, other than cap and fuse) or using electric detonators, all personnel shall stay out of the blast site for at least 15 minutes.

(f) If there is reason to believe that the explosive is burning in the hole, no person shall return to the vicinity of the misfire for at least 12 hours, and the site shall be guarded in the interim.

(g) If a misfire is suspected, all initiating circuits (electric or non-electric) shall be carefully traced and a search made for unexploded charges.

(h) No drilling, digging, or picking shall be permitted until all misfires have been detonated or until the blaster in charge approves the resumption of work.

(i) No person shall be permitted to examine a shot after a misfire until specifically authorized by the blaster. If practicable the misfired charge shall be re-primed and fired. Misfires shall be handled only by or under the direction of the blaster.

(6) Disposal of Explosive Materials.

(a) Empty containers and packages and paper or fiberboard packing materials that have previously contained explosive materials shall not be reused for any purpose. Such packaging materials shall be destroyed by burning at an approved outdoor location. All personnel shall remain at a safe distance from the disposal area.

(b) All explosive materials that are obviously deteriorated or damaged shall not be used and shall be destroyed according to the instructions of the manufacturer.

(c) In the event that it becomes necessary to destroy any explosives, either because of damage to containers, deterioration, or any other reason, all handling of explosives shall cease and the manufacturer shall be immediately contacted for assistance. The manufacturer's advice shall be followed without deviation.

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(7) Quarry Blasting.

(a) Quarry blasting shall be conducted in strict compliance with 527 CMR 13.09.

(b) Whenever quarry blasting is conducted within 500 feet of building(s) used for human habitation a series of durable warning signs shall be erected along the entire perimeter of any rock face more than six feet high. They shall be spaced not more than 75 feet apart and set back a reasonable distance from the face. Each sign shall contain the words "WARNING - BLASTING AREA - DANGER" in letters at least two inches in height.

(c) Alternative Allowable Vibration Levels: Alternative limits of the effect of blasting may be adopted for quarry operations located adjacent to inner city areas as a local municipal regulation adopted in accordance with M.G.L. c. 148, § 9.

(8) Blaster's Log:

(a) A blaster who performs blasting operations shall maintain a blaster's log on a form approved by the Marshal recording each blast The blaster's log shall be completed within six hours of a blast and retained for a minimum of three years from the date of the blast.

(b) Blasters' logs shall be made readily available to the Marshal, the head of the local fire department or their designees. The blaster's log shall contain the;

1. Name, signature, and Certificate of Competency Number of the blaster in charge.
2. Blast location, address, city, description
3. Date and time of blast
4. Type of material blasted
5. Distance in feet, to the nearest inhabited building or structure, neither owned or leased by holder or holder client of the Explosives User Certificate.
6. Scaled distance or alternative option used to determine blast design
7. Type of matting or cover over blast if applicable
8. Weather conditions, including temperature, cloud cover, wind direction
9. Blast plan and sketch showing blast hole diameter, delay, delay pattern and types of detonators, spacing, depth of blast hole, hole pattern and number of holes
10. Explosive material type, size, total weights of each explosive by hole
11. Type of initiation system. (Methods of firing and type of circuit)
12. Feet of over burden, depth and type of stemming
13. Maximum weight of explosives detonated within any eight millisecond period.
14. The seismograph(s) location(s) including distance and direction from the seismograph to the closest borehole and from the seismograph to the closest structure.
15. Seismograph readings including peak particle velocity, frequency and airblast
16. Type of seismograph, instrument make, model serial number, calibration date and sensitivity settings
17. Name of person taking the seismograph reading. The name and firm analyzing the seismograph record if applicable.
18. Complaints or comments following the blast.

(c) Blasts that exceed the maximum allowable peak particle velocity frequency or decibel levels established by 527 CMR 13.00 or are known by the blaster in charge to have produced flyrock, shall be reported to the head of the local fire department within 24 hours and a written report shall be provided within five days.

(d) Blasters' logs shall be available at any time for inspection by the head of the local fire department, the Marshal, their designees, or a police officer representing the Use and Handling permit issuing authority.

(9) Allowable Limits of Effects of Blasting.

(a) Blasting effects include ground vibration, airblast and flyrock. Allowable limits of airblast and ground vibration contained in 527 CMR 13.00 are based, with a conservative factor of safety, upon extensive government, university, and engineering research which has established the amount and character of vibration so as to prevent damage and to insure the safety of the public and the protection of property adjacent to the blast area.

Except as otherwise authorized by 527 CMR 13.00, blasting shall be conducted so that the affects of ground vibration and airblast, as indicated by the seismograph readings (including extrapolations when required), do not exceed the limits specified in 527 CMR 13.09(9) figures (a) and (b), and Table 3, and shall conform to either Option 1 or Option 2 listed in 527 CMR 13.09(9)(b).

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(b) The blaster shall use one of the options specified below:
Option 1: Scaled Distance Equations. The blasting operation shall use a seismograph to monitor a blast to assure compliance with Table 1 and Table 2 and Figure (a) and (b), or may be granted special permission by the Marshal or the head of the local fire department to utilize a modified scaled distance factor.

Table 1

Distance from Blast (Feet)	Scaled Distance Factor (D_s)
0 - 49	Construction*
50 - 300	50
301 - 5000	55
Over 5001	65

*Explosive weights are as contained in the Example

SCALED DISTANCE

Formula Charge weight per delay (W) = $(D / Ds)^2$

Where W = Weight of explosives detonated per delay period (within 8 milliseconds) in pounds

D = Distance from borehole to closest structure in feet.

D_s = Scaled Distance Factor (in Ft / lbs to the 0.50 power)

Example Distance to structure = 100 feet
Scaled distance (from Table 1) = 50
Weight = ?

$W = (100 / 50)^2 = (2)^2 = 4$ lbs. per delay

Formula Distance per Charge weight $D = Ds (W)^{0.5}$

Example $50(4)^{0.5} = 100$ feet

Where W = Weight of explosives detonated per delay period (within 8 milliseconds) in pounds

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Table 2

Distance in Feet	Construction Distance 0-49 (W=lbs)	Scaled Distance 50 50 - 300 (W=lbs)	Scaled Distance 55 301-5000 (W=lbs)	Scaled Distance 65 Over 5001 (W=lbs)
0-10	0.12			
11-15	0.25			
16-20	0.50			
21-24	0.75			
25-49	0.85			
50		1.00		
75		2.25		
100		4.00		
200		16.00		
300		36.00		
400			52	
500			82	
600			119	
700			161	
800			211	
900			267	
1000			330	
1500			743	
2000			1322	
3000			2975	
4000			5289	
5000			8264	
6000				8520
7000				11597
8000				15147
9000				19171
10000				23668

When the blasting operation considers the scaled distance equations of Option 1 as being too restrictive, the operation may petition the Marshal or the head of the local fire department to use a modified scaled distance equation. Such a petition shall demonstrate that the use of a modified scaled distance equation would not cause predicted ground vibration to exceed the peak particle velocity limits specified in Figure (a) or Figure (b). Any petition for modification of the scaled distance equations shall be throughly substantiated by seismograph recordings to show that the limitations of Figure (a) or Figure (b) will not be exceeded.

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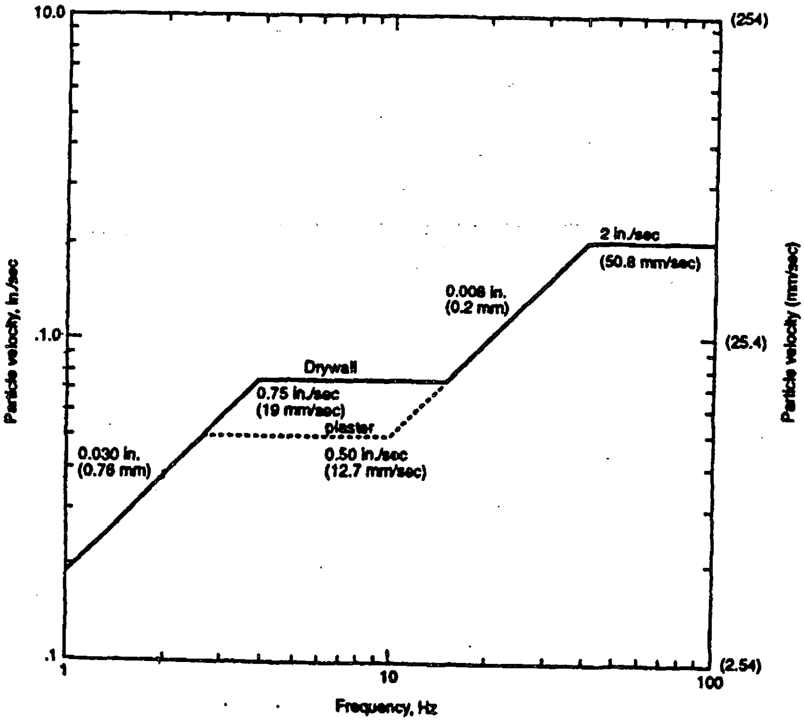
Option 2: In lieu of tables 1 and 2, a blaster may, after notification to the permit granting authority, have the option to use the graphs shown in Figures (a) or (b) to limit peak particle velocity based upon the frequency of the blast vibration.

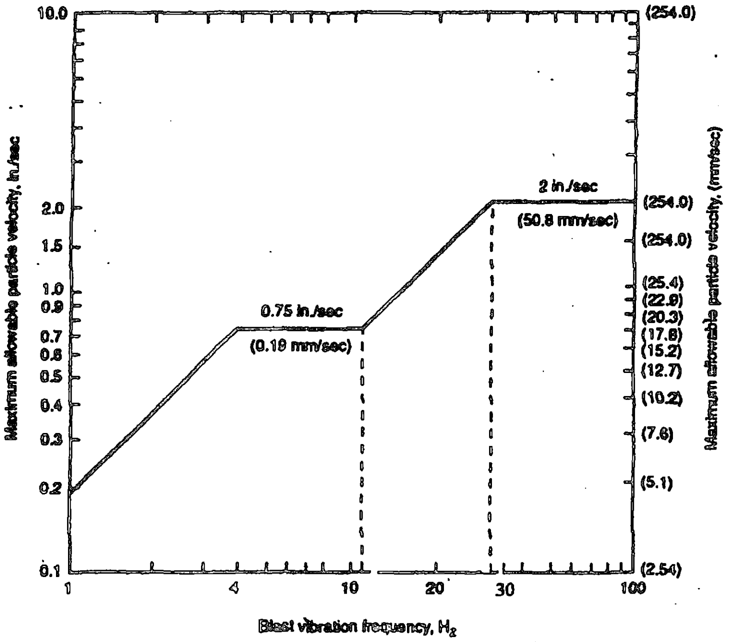
Figure (a)



PARTICLE VELOCITY v. FREQUENCY
UNITED STATES BUREAU OF MINES RECOMMENDATION
(RI850 7, 1980)

13.09: continued

Figure (b)



PARTICLE VELOCITY v. FREQUENCY
OFFICE OF SURFACE MINING REGULATION

13.09: continued

Air blast. Airblast as indicated by readings of a seismograph placed in accordance with 527 CMR 13.09(9)(c) 3, shall not exceed the maximum limits in Table 3.
Exception: The owner of any property not owned, leased or controlled by the blasting operation has provided a written waiver to the blasting operation to exceed the limits in Table 3 at said property.

Table 3

Lower Frequency Limit of Measuring System		Maximum Allowable Level (Decibels)
0.1 Hertz or lower when using a 0.1 Hz high pass linear measurement method*	Flat Response	134 Peak
2 Hertz or lower when using a 2.0 Hz linear peak response	Flat Response	133 Peak
6 Hertz or lower when using a 5 or 6 Hz linear peak response	Flat Response	129 Peak
C - Weighted when using the db-C weighting scale and when events do not exceed a 2 second duration	Slow Response	105 Peak dbc

*Only when approved by the Marshal or the head of the local fire department

Flyrock. Flyrock traveling in the air or along the ground shall not be cast from the blast site in an uncontrolled manner which could result in personal injury or property damage. Flyrock shall not be propelled from the blast area onto property not controlled by the blasting operation.

(c) Seismic instruments shall be capable of reading and recording the acceptable level limits specified in this section and shall be maintained and calibrated in accordance with the instructions of the instrument manufacturer. Records of maintenance and calibration shall be made available to the Marshal and the head of the local fire department upon request.

1. In order to meet the intent of 527 CMR 13.00 seismic measurement records shall include peak particle velocity, particle velocity, time history, and vibration frequency levels, the distance and direction from the closest borehole, and the exact location of the instrument.
2. All seismographs used to comply with 527 CMR 13.00 shall meet the following minimum specifications:
   a. Seismic Frequency Range: 2 to 200 Hz (± 3db)
   b. Acoustic Frequency range; 2 to 200 Hz (± 1db)
   c. Velocity Range: 0.02 to 4.0 inches/second
   d. Sound Range: 90 to 140 db Linear
   e. Transducers: Three mutually perpendicular axes (Radial, Transverse and Vertical)
   f. Recording: Provide time-history of waveform
3. Seismograph Placement: The seismograph shall be placed at the nearest inhabited building or structure adjacent to the blast area that is not owned, leased, or controlled by the blasting operation. The seismograph shall also be placed on or in the ground on the side of the structure directly facing the blast site and shall be placed within five to ten feet of the structure. In these cases compliance with 527 CMR 13.00 shall be determined by the recordings at the seismograph. If there is no suitable location for seismograph placement within ten ft. of the structure that is mutually agreed upon by the blaster and the head of the fire department or his designee, the condition which made it unsuitable to place to seismograph within ten feet of the structure and the alternative location agreed upon by the head of the fire department or his designee shall be noted, in writing in the blast plan. In these cases, compliance with 527 CMR 13.00 shall be determined by using seismograph recordings and extrapolating ground vibration and air blast, to the nearest inhabited structure, using accepted engineering practices.

13.09: continued

Exception: If the person in control of said nearest structure refuses to grant permission for seismograph placement as required by 527 CMR 13.09(9)(c)3., the head of the fire department shall be immediately notified. Such refusal shall be further documented in writing by the blaster and be placed in the blasting record. Placement of the seismograph shall then be at a location mutually agreed upon by the blaster and the head of the fire department or his designee.

(d) In the case of underground pipelines, bridges, roadways, steel construction and other heavy construction where prescribed vibration or airblast levels would be overly restrictive in relation to the nature of the project vibrations and airblast levels in excess of the tables listed above shall be allowable when authorized in writing by the owner or representative of the owner of adjacent inhabited building(s) or structure(s) within the blast area.

(e) Preblast surveys shall be conducted in accordance with 527 CMR 13.09(10). Preblast surveys may be waived in Construction blasting at the option of the head of the local fire department.

(f) Seismograph monitoring shall be required for all blasting operations.

(10) Preblast Inspection Surveys.

(a) The intent of a preblast survey is to provide documentation of the existing physical condition of buildings and structures within the blasting area with the dimensions of each observed defect clearly noted. When blasting within 250 feet of a structure, as measured from the closest borehole to the structure, or structures, not owned or controlled by the project, a pre blast inspection survey shall be offered. It shall be the responsibility of the blaster to notify structure owners of the survey.

1. The preblast survey shall document the existing visual conditions of the interior and exterior of the structure including improvements to the property and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, transmission lines, cisterns, wells, and other water systems warrant special attention; however the assessment of these structures may be limited to surface conditions and other readily available data.

2. The survey shall accurately record deficiencies by means of written notes, sketches, photographs, video tape, cassette tape narrative or any other format or combination that sufficiently depicts the pre-existing conditions prior to the blasting.

3. If the owner refuses the survey the inspector shall request that he sign a waiver of the survey. A pre blast survey waiver shall be made on a form approved by the Marshal. If the owner or occupant refuses to sign a waiver, the inspector shall sign the waiver attesting to the refusal.

4. Three attempts shall be made to contact the owner to offer the survey. If no response is made after the second attempt, or the owner refuses to sign a survey waiver, a notice offering the survey shall be sent via any carrier capable of providing a receipt of delivery. A receipt of delivery shall satisfy this requirement.

(b) Surveys shall be conducted by technicians familiar with construction methods and materials, familiar with blasting procedures, and 527 CMR 13.00.

(c) Surveys in excess of the above may be conducted at the discretion of the blaster . If the owner or occupant request surveys in excess of 527 CMR 13.09(10), the cost of the survey(s) shall be paid by the owner or occupant of the structure.

(d) Requirements for pre blast survey may be suspended if the blaster adheres to 527 CMR 13.09(9)(b), Option 1. If this option is selected the blaster named on the Use and Handling Permit shall sign a statement of compliance, on a form approved by the Marshal, to adhere to a Scaled Distance.

(e) When a blast inspection is made, the results of that inspection may only be made available to the head of the local fire department, the Marshal or their designees upon request with the written consent of the occupant of the structure. The blast inspection shall be made available to the owner of the inspected property within a reasonable time after request is made in writing. Failure to provide a blast inspection report within 30 days of such request shall be grounds for revocation of a Use and Handling permit.

(11) Underwater Blasting.

(a) Loading of tubes and casings of dissimilar metals shall not be used because of possible transient electric currents from galvanic action of the metals and water.

13.09: continued

(b) Only water resistant blasting caps and detonating cords shall be used for all marine blasting. Loading shall be done through a non sparking metal loading tube when a tube is necessary.
(c) No blast shall be fired while any vessel under way is closer than 1,500 feet from the blast area. Those on board vessels or craft moored or anchored within 1,500 feet shall be notified before a blast is fired.
(d) No blast shall be fired while any swimming or diving operations are in progress in the vicinity of the blasting area. If such operations are in progress, signals and arrangements shall be agreed upon to assure that no blast shall be fired while any person is in the water.
(e) A red blasting flag, 18 inches by 30 inches with the word "EXPLOSIVES" thereon in white letters, at least six inches in height, shall readily be visible in all directions.
(f) The storage of explosive material shall be in accordance with 527 CMR 13.05(4).
(g) When more than one charge is placed under water, a float device shall be attached to an element of each charge in such a manner that it will be released by firing. Misfires shall be handled in accordance with 527 CMR 13.09(5).

(12) Charge Activated Device. The use of charge activated hydraulic devices shall comply with the following:
(a) Use and Handling Permits shall be obtained as required in 527 CMR 13.04(11).
(b) They shall be exempt from the following, 527 CMR 13.09(1)(k) Blast Analysis. 527 CMR 13.09(9)(f) the use of a seismograph. However, the Blast Design Plan, 527 CMR 13.09(1)(l) is required.
(c) A blaster's log shall be maintained in accordance with 527 CMR 13.09(8).
(d) Matting of sufficient size and strength shall be utilized during all detonations.
(e) All holes must be drilled to the manufacturers specifications and no hole shall be redrilled.

(13) Blasting Damage Complaint.
(a) Any person or firm alleging damage as a result of blasting operations shall make a complaint on a "Blasting Damage Complaint" form approved by the Marshal and obtained from the local fire department of the city or town where damage occurred. The Complaint shall contain a signed certification. Completed complaint forms shall be returned within 30 days of blasting incident to the head of the fire department concerned.
(b) The head of the local fire department upon receiving a Blasting Damage Complaint form shall cause the holder of the "Explosives Users Certificate" [Own and Possess] and the blaster in charge, to report to the local fire department with copies of pertinent blasters' logs for the dates in question and to provide copies of the blaster's log for the dates alleged. The blaster in charge shall be interviewed and blast logs examined to determine any violations of 527 CMR 13.00. The local fire department authority shall record the results of his inquiry on the Blasting Damage Complaint Form. The head of the fire department shall retain the original of the complaint form and forward a copy to the Marshal's Office. The holder of the Explosives Users Certificate [Own and Possess] shall receive a copy of the complaint form and acknowledge receipt by signature and date in the space provided on the complaint form. The holder of the Explosives Users Certificate or the holder's insurance carrier shall respond to the claimant within 30 days after the date that the holder received the complaint form.

13.10: Explosive Manufacturing

(1) Manufacture of explosives shall only be conducted by persons possessing a Federal Explosives Manufacturer License granted in accordance with 27 CFR Part 55. A permit for the manufacturing of explosives shall also be obtained from the Marshal. Said permit shall not be issued until the applicant exhibits a valid Federal Explosives Manufacturer License granted in accordance with 27 CFR Part 55.

(2) All explosives manufactories shall be supplied with some means of direct communication with the local fire department, such as telephone or fire alarm boxes, for immediate notice in case of fire.

(3) There shall be a competent watchman on guard at all explosive manufactories except when the same are in actual operation.

13.10: continued

(4) The entire occupied portion of the premises of an explosives manufacturing building shall be enclosed by a suitable fence to enable the management to have control of all persons entering such premises, and any building in which wet fulminate is stored or dried shall be likewise enclosed within a separate enclosure, the entrance to which shall be kept locked. There shall be a sufficient number of notices conspicuously posted on the outside of these enclosures warning of the business conducted therein.

(5) No dry vegetation or combustible rubbish shall be allowed to accumulate within 50 feet of any building connected with such manufactories.

(6) The mixing, compounding, handling, charging or loading of ingredients used in an explosives manufactory shall be conducted by a competent person.

(7) Persons under the age of 18 years shall not be employed in an explosive manufactory and shall not be permitted to enter such manufactory unless accompanied at all times by some responsible adult person.

(8) Smoking shall be prohibited upon the premises of explosive manufactories except that smoking may be permitted in such places as may be designated by the head of the fire department in writing. Green and white "smoking area" signs shall be prominently displayed in areas where smoking is permitted. Red and White "No Smoking" signs shall be conspicuously posted about the premises where smoking is prohibited. The carrying of matches or other flame-producing devices upon the premises of explosive manufactories shall be prohibited except in the receptacles especially provided, and only when authorized by the person in charge of the manufactory.

NON-TEXT PAGE

13.11: Small Arms Ammunition and Primers, Smokeless Propellants, and Black Powder

(1) Basic Requirements.

(a) 527 CMR 13.11 shall apply to the transportation and storage of small arms ammunition, primers and components, smokeless propellants and black powder.

(b) In addition to all other applicable requirements of 527 CMR 13.00, intrastate transportation of small arms ammunition, small arms primers, smokeless propellants, and black powder shall comply with U.S. Department of Transportation Hazardous Materials Regulations.

(c) 527 CMR 13.11 shall apply to the channels of distribution of and to the users of small arms ammunition, small arms primers, smokeless propellants, and black powder.

(d) 527 CMR 13.11 shall not apply to in-process storage and interplant transportation during manufacture.

(2) Small Arms Ammunition.

(a) No restrictions shall be imposed on the interstate transportation of small arms ammunition other than those imposed by the U.S. Department of Transportation or by other hazardous materials regulations.

(b) Quantity limitations may be imposed by the head of the local fire department on the storage of small arms ammunition in warehouses, retail stores, and other occupancies by the limitations of the storage facility and by 527 CMR 13.00.

(c) Small arms ammunition shall be separated from materials classified by the U.S. Department of Transportation as flammable or combustible liquids, flammable solids, and oxidizing materials by a distance of 15 feet or by a fire partition having a fire resistance of at least one hour.

(d) Small arms ammunition shall not be stored together with explosives unless the storage facility is suitable for the storage of explosives.

(e) Small arms ammunition that has been exposed to fire or damaged by exposure to water shall not be returned to commercial channels for reasons of consumer safety. The manufacturer shall be contacted to obtain recommendations for disposal of damaged ammunition.

(3) Small Arms Ammunition Primers.

(a) Small arms ammunition primers shall be transported, kept, or stored in containers approved by the U.S. Department of Transportation.

(b) Transportation of small arms ammunition primers shall comply with U.S. Department of Transportation Regulations.

(c) No more than 5,000 small arms ammunition primers shall be transported in a private vehicle.

(d) No more than 5,000 small arms primers shall be stored in residences.

(e) No more than 10,000 small arms primers shall be placed on display in commercial establishments.

(f) Commercial stocks of small arms primers shall be stored as follows:

1. Quantities not exceeding 750,000 may be stored in a building if not more than 100,000 are stored in any one pile and piles are at least 15 feet apart.

2. Quantities exceeding 750,000 may be stored in a building if the following conditions are met:

a. The warehouse or storage room shall not be accessible to unauthorized personnel.

b. Primers shall be stored in cabinets. No more than 200,000 primers shall be stored in any one cabinet.

c. Shelves in cabinets shall have vertical separation of at least two feet.

d. Cabinets shall be located against walls of the warehouse or storage room with at least 40 feet between cabinets.

e. Separation between cabinets may be reduced to 20 feet if barricades twice the height of the cabinets are attached to the wall midway between each cabinet. The barricades shall extend at least ten feet outward, shall be firmly attached to the wall, and shall be constructed of ¼-inch boiler plate, two-inch thick wood, brick, or concrete block.

f. Primers shall be separated from materials classified by the U.S. Department of Transportation as flammable liquids, flammable solids, and oxidizing materials by a distance of 25 feet or by a fire partition having a fire resistance of at least one hour.

13.11: continued

g. The building shall be protected by an automatic sprinkler system installed according to 780 CMR, the Massachusetts Building Code and NFPA 13, *Standard for the Installation of Sprinkler Systems.*

(g) Small arms primers not stored according to 527 CMR 13.11(3)(a) or (b) shall be stored in a Type 4 magazine constructed and located according to 527 CMR 13.00.

(4) Smokeless Propellants.

(a) Transportation of smokeless propellants not exceeding 25 lbs in a private vehicle, shall be transported in shipping containers approved by the U.S. Department of Transportation.

(b) Transportation of quantities of smokeless propellants exceeding 25 lbs but not exceeding 48 lbs, in a private vehicle, shall be transported in a portable magazine having wood walls of at least one inch nominal thickness, and permitted by the Marshal in accordance with 527 CMR 13.04(6).

(c) Transportation of more than 48 lbs. of smokeless propellants in a private vehicle is prohibited.

(e) Smokeless propellants shall be stored in original shipping containers specified by U.S. Department of Transportation Hazardous Materials Regulations.

(f) Smokeless propellants intended for private use in quantities not exceeding 48 lbs stored in residences shall be kept in the original manufacturers container or in a wooden box or cabinet having wooden walls of at least one-inch nominal thickness. All smokeless propellants stored in private residences shall be stored in the original containers; such containers shall be secured in a locked cabinet, closet, or box when not in use.

(g) Smokeless propellants intended for sale in quantities not exceeding 25 lbs, stored in original manufacturers containers of one lbs maximum capacity, may be displayed in commercial establishments without a permit from the head of the local fire department.

(h) Commercial stocks of smokeless propellants shall be stored as follows:

1. Quantities exceeding 25 lbs, but not exceeding 100 lbs, shall be stored in portable wooden boxes having walls of at least one-inch thickness.

Smokeless propellants of 100 pounds or less kept for sale in a building or structure shall be stored in a box or cabinet with wooden walls at least one inch thick. The box or cabinet shall be plainly marked "GUNPOWDER" and shall be kept locked at all times except when necessary to gain access and shall be located on the first floor of the building or structure and shall not be more than ten feet from an exit door.

2. Quantities exceeding 100 lbs, but not exceeding 800 lbs, shall be stored in original manufacturers containers in non portable storage cabinets having walls of at least one inches thickness. Not more than 400 lbs may be stored in any one cabinet, and cabinets shall be separated by a distance of an least 25 feet or by a fire partition having a fire resistance of at least one hour.

3. Quantities exceeding 800 lbs, but not exceeding 5,000 lbs, may be stored in a building if the following requirements are met:

a. The warehouse or storage room shall not be accessible to unauthorized personnel.

b. Smokeless propellant shall be stored in non portable storage cabinets having wood walls at least one inch thick and having shelves with no more than three feet separation between shelves.

c. No more than 400 lbs shall be stored in any one cabinet.

d. Cabinets shall be located against walls of the storage room or warehouse with at least 40 feet between cabinets.

e. Separation between cabinets may be reduced to 20 feet if barricades twice the height of the cabinets are attached to the wall, midway between each cabinet. The barricades shall extend at least ten feet outward, shall be firmly attached to the wall, and shall be constructed of ¼ inch boiler plate, two inches thick wood, brick, or concrete block.

f. Smokeless propellant shall be separated from materials classified by the U.S. Department of Transportation as flammable liquids, flammable solids, and oxidizing materials by a distance of 25 feet or by a fire partition having a fire resistance of at least one hour.

g. The building shall be protected by an automatic sprinkler system installed according to 780 CMR, the Massachusetts State Building Code and NFPA 13, *Standard for the Installation of Sprinkler Systems.*

13.11: continued

(i) Smokeless propellants not stored according to 527 CMR 13.11(1), (2), and (3) shall be stored in a type 4 magazine constructed and located according to 527 CMR 13.00.

(5) Black Powder.
(a) Black powder not exceeding five lbs transported in a private vehicle, shall be transported in shipping containers approved by the U.S. Department of Transportation.
(b) Transportation of quantities of black powder exceeding five lbs but not exceeding 25 lbs, in a private vehicle, shall be transported in a portable magazine having wood walls of at least one inches nominal thickness, and permitted by the Marshal in accordance with 527 CMR 13.04(6).
(c) Transportation of more than 25 lbs. of black powder in a private vehicle is prohibited.
(d) Transportation of black powder in excess of 25 lbs, interstate, shall be according to U.S. Department of Transportation Regulations.
(e) Black powder shall be stored in shipping containers specified by the U.S. Department of Transportation Hazardous Materials Regulations.
(f) Black powder intended for private use in quantities not exceeding five lbs, stored in residences, shall be kept in manufacturers containers or in a wooden box or cabinet having wooden walls of at least one inch nominal thickness. All black powder stored in private residences shall be secured in a locked cabinet, closet or box when not in use.
(g) Black Powder intended for sale in quantities exceeding five lbs, stored in the original manufacturers containers of one lb maximum capacity may be displayed in commercial establishments with a permit from the head of the local fire department.
(h) Commercial stocks in a building in quantities not exceeding 50 lbs shall be stored in a Type 4 indoor magazine that is plainly marked "GUNPOWDER". The magazine shall be kept locked at all times except when necessary to gain access and shall be located on the first floor of the building or structure and not more than ten feet from an exit door..
(i) Commercial stocks in quantities exceeding 50 lbs shall be stored in a Type 4 outdoor magazine.
(j) If smokeless propellants are stored in the same magazine with black powder, the total quantity shall not exceed that permitted for black powder.
(k) Commercial shipments of black powder intended for use in small arms may be shipped [in quantities not exceeding 50 lbs], subject to the requirements set forth in U.S. Department of Transportation, Exemption Certificate E-8958.

13.12: General Provisions

(1) All premises where explosive materials are handled or kept shall be provided with such additional fire protection equipment as the Marshal or head of the local fire department may require.

(2) No flammable or combustible liquid, sulfur, carbon or any other organic chemical shall be stored in close proximity to any chlorate or perchlorate or any other oxidizing agents.

(3) Explosives Transaction Records.
(a) All persons keeping, storing, using, selling, manufacturing, handling or transporting explosive material shall maintain records so that the quantity and location of such explosive materials are readily available for inspection by the head of the fire department, the Marshal, their designees, or a police officer. Quantity and location records shall be delivered to the Marshal forthwith upon demand.
(b) Daily Summary of Magazine Transactions: In taking the inventory required by 527 CMR 13.12(3)(a), a licensee or permitee shall enter the inventory in a record of daily transactions which shall be kept for each magazine on a storage facility. These records may be kept at one central location on the business premises if separate records of daily transactions are kept for each magazine. Not later than the close of the next business day, each licensee or permitee shall record by the manufacturer's name or brand name, the total quantity received in and removed from each magazine during the day, and the total quantity remaining on hand at the end of the day. Any discrepancy which might indicate a theft or loss of explosive materials shall be reported to the Marshal immediately.

13.12: continued

(c) Discontinuance of Business: Where an explosive materials business or operations is discontinued or succeeded by a new licensee or registrant, the records prescribed by 527 CMR 13.12(3) shall appropriately reflect such facts and shall be delivered to the successor. Where discontinuance of the business or operation is absolute, copies of the records required by 527 CMR 13.12 shall be delivered to the Marshal within 30 days following the business or operation discontinuance.

(d) Any person who transports or delivers explosive materials to any magazine, building or structure shall keep a record of the permit number assigned to said magazine, building or structure by the Marshal in accordance with 527 CMR 13.04(3)(b).

(4) Theft: The loss or theft of any explosives shall be immediately reported to the Marshal and confirmed in writing within 24 hours..

(5) No explosive subject to 527 CMR 13.00 shall be sold or exposed for sale on any highway.

(6) No high explosive subject to 527 CMR 13.00 shall be sold to any person under 21 years of age.

(7) The Marshal or his designee may, in his discretion, upon discovering a violation of 527 CMR 13.00 or upon determination of a fire or explosion hazard, require the removal of any explosive material or that a watchman be placed continuously in charge of it. The expense of said removal or watchman shall be the responsibility of the person in whose possession the explosive material is found.

(8) Any explosion, fire or collision occurring in connection with the keeping, storage, manufacture, sale, transportation or use of explosive material causing loss of life or injury to any person or damage to property shall be reported immediately to the Marshal and the head of the fire department, giving an account of the same, and then confirmed giving a detailed account in writing within 24 hours.

(9) Any explosive used, sold, transported or stored within the Commonwealth shall be legibly identified by a characteristic number, color code, or other mark placed by the manufacturer which may be viewed by one skilled in making such identification. Such numbering systems may be limited to the identification of each manufacturer, and the location, date, and shift of manufacture, and shall be included on each piece of the smallest subdivision of explosive.

(a) Manufacturer's identification described above shall be placed on the outside of each cartridge, bag, or other immediate container of explosive materials.

(b) Blasting caps shall be identified, by identification marks prescribed in 527 CMR 13.12(9), placed on the outside of immediate containers used for packaging the blasting cap.

(10) Any person, firm or corporation in the Commonwealth who keeps, uses, sells, transports or stores any explosive shall keep a record of the disposition of such explosive by recording the batch number, if any, from the case from which individual explosive has been removed, if sold in less than case lots, or the number of cases with their batch numbers if sold in case lots. The person to whom such explosive has been transferred shall record the transaction and such records shall be maintained for ready inspection by the Marshal, the head of the local fire department, or the head of the police department, or their designees, for a period of three years.

(11) No person shall use, keep, store, handle, or transport explosive materials or blasting agents when such use, keeping, storage, handling or transportation constitutes a hazard to life or property. The Marshal may, in his discretion, further increase or restrict any requirement or provision of 527 CMR 13.00.

(12) Laboratories: Industrial laboratories, laboratories of technical institutes, colleges, universities, and similar institutions may be permitted to keep, store and use explosives or blasting agents when confined to the purpose of scientific or technical instruction or research, provided the storage and use of explosives or blasting agents is conducted or supervised by a person holding a Certificate of Competency and not more than 50 pounds of explosive are kept on hand at any time in such laboratories.

13.13: References

International Society of Explosives Engineers. ISEE Field Practice Guidelines for Blasting Seismographs(ISEE Approved December 1999), ISEE Blaster's Handbook, 17th edition

IME Publications
Safety Library Publication No. 1, *Construction Guide for Storage Magazines*, August 1993
Safety Library Publication No. 2, *The American Table of Distances*, June 1991
Safety Library Publication No. 3, *Suggested Code of Regulations for the Manufacture, Transportation, Storage sale, Possession, and Use of Explosive Materials*, January 1985
Safety Library Publication No. 12, *Glossary of Commercial Explosives Industry Terms*, February 1991
Safety Library Publication No. 17, *Safety in the Transportation, Storage, Handling, and Use of Explosive Materials*, March 1987
Safety Library Publication No. 22, *Recommendations For the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials*, May 1993

ANSI Publication. American National Standards Institute, Inc., 1450 Broadway, New York, NY 10018
ANSI A10.7, *Safety Requirement for the Transportation, Storage, Handling, and Use of Commercial Explosives and Blasting Agents in the Construction Industry*, 1970

NFPA Publication. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA. 02269-9101
NFPA 495, *Explosive Materials Code*, 1992 edition

U.S. Government Publications. U.S. Government Printing Office, Washington, DC. 20402
Ammunition and Explosives Safety Standards, DOD 6055.9STD, U.S. Department of Defense Explosives Safety Board, Washington, DC 20314
ATF: Explosives Laws and Regulations; ATF Publication 5400,7; U.S. Bureau of Alcohol, Tobacco, and Firearms; Washington, DC; November 1992
Explosives and Blasting Procedures Manual; Dick, R.A., Fletcher, L.R., and D'Andrea, D.V.;
Information Circular 8925, U.S. Bureau of Mines, Washington, DC; 1983
Explosives Hazard Classification Procedures; DLAR 8220.1; Defense Logistics Agency, Washington, DC; 1981
Explosive Materials Regulations, U.S. Bureau of Alcohol, Tobacco, and Firearms; Title 27, Code of Federal Regulations, Part 55 and 181
Hazardous Materials Regulations, U.S. Department of Transportation, Title 49, Code of Federal Regulations, Part 174.16
Rock Blasting and Overbreak Control, U.S. Department of Transportation, Federal Highway Administration, National Highway Institute Course No 13211, Publication No, FHWA-HI-92-001, 1991.

Massachusetts Government Publications. Massachusetts Secretary of State, [Massachusetts State House Book Store] State House Boston, Massachusetts
Explosives; Board of Fire Prevention Regulations, 527 CMR 13.00
Fire Prevention; Massachusetts General Law, Chapter 148.

13.14: Pre / Post Blast Inspection Waiver

Date of Survey:

Location of Property: Type of Structure:

Property Owners Name:

Property Owners Address:

Property Owners Telephone Number:

I hereby declare I am the owner of the above property located within 250 feet of a planned blasting site. I acknowledge that I have been made aware of my rights, in accordance with 527 Code of Massachusetts Regulation (CMR 13.00: *Explosives.* to have at my option a Preblast Inspection Survey performed upon my property at no expense to myself.. I understand the purpose of this Survey is to record the existing condition of my property prior to blasting. By my signature below I hereby waive my right to a Preblast Inspection Survey.

Signature of Property Owner: Date Signed:

CERTIFICATION OF SURVEYOR OFFERING SURVEY

Name of Blaster or firm offering Survey:

Address of Blaster or firm offering Survey:

Date of Survey Refusal:

I hereby declare under the penalty of perjury that I have contacted the property owner listed above and have advised this person of his right to have a Preblast Survey conducted at no expense to himself. By my signature below I declare the property owner has refused the offer of a survey and has also refused to initiate a survey waiver. I further declare the statements made and the information given herein are true. I am aware that there are significant penalties for submitting false information including possible fines, civil penalties and imprisonment.

Signature of Blaster: Date Signed:

RECORDING OF SURVEY REFUSAL

Fire Department:

Name of Officer Receiving Waiver: Date:

Blaster or firm Offering Survey: Date of Refusal:

Use and Handling [Permit to Blast] Issued to: Date of Anticipated Blast:

Blasters Name:

Certificate of Competency No:

Signature of Officer Acknowledging Refusal: Date:

FP Form CMR 13.14 (Rev. 12/95)

13.15: Blasting Damage Complaint Form

Any blasting damage complaint shall be on a blasting damage complaint form approved by the Marshal.

REGULATORY AUTHORITY

527 CMR 13.00: M.G.L. c. 148 §§ 9, 10, 12, 13, 15, 16, 31, and 35.

527 CMR 14.00: FLAMMABLE AND COMBUSTIBLE LIQUIDS, FLAMMABLE SOLIDS OR FLAMMABLE GASES

Section

14.01: Scope
14.02: Definitions
14.03: Storage
14.04: Handling of Flammable Fluids
14.05: Handling of Flammable Gases
14.06: Handling of Flammable Solids
14.07: Fire Control
14.08: Referenced Publications

14.01: Scope

527 CMR 14.00 shall apply to the storage and handling of flammable liquids, combustible liquids, flammable solids and flammable gases.

(2) 527 CMR 14.00 shall not apply in any instance where the use or occupancy of any building or other structure is specifically regulated by other rules and regulations of the Board of Fire Prevention Regulations.

(3) All tanks, containers, vessels and transport vehicles are to be considered full for the purpose of permitting required under 527 CMR 14.00 or licensing as required by M.G.L. c. 148, § 13.

14.02: Definitions

For the purpose of 527 CMR 14.00, the following terms shall have the meanings respectively assigned to them:

Approved: approved by the Marshal

Boiling Point: the temperature at which the vapor pressure of a liquid equals the atmospheric pressure of 14.7 pounds per square inch gauge (psig) or 760 mm of mercury. Where an accurate boiling point is unavailable for the material in question, or for mixtures which do not have a constant boiling point, for purposes of this classification, the 10% of a distillation performed in accordance with ASTM D86 shall be used as the boiling point of the liquid.

Combustible Liquid: Any liquid having a flash point at or above 100°F shall be known as a Class II or Class III Liquid. Combustible liquids shall be divided into the following classifications:
Class II: Liquids having flash points at or above 100°F and below 140°F.
Class IIIA: Liquids having a flash point at or above 140°F and below 200°F.
Class IIIB: Liquids having a flash point at or above 200°F.

Compressed Gas: Any material or mixture having in the container an absolute pressure exceeding 40 psi at 70°F (276 kPa at 21°C) or, regardless of the pressure at 70°F (21°C), having an absolute pressure exceeding 140 psi at 130°F (965 kPa at 65°C) or any flammable material having a vapor pressure exceeding 40 psi at 100°F (176 kPa at 38°C) as determined by ASTM D323.

Flammable Compressed Gas: Either a mixture of 13% or less (by volume) with air forms a flammable mixture, or the flammable range with air is wider than 12% regardless of the lower limit. These limits shall be determined at atmospheric temperature and pressure.

Flammable Liquid: Any liquid having a flash point below 100°F and having a vapor pressure not exceeding 40 psia at 100°F Flammable liquids shall be known as Class I liquids and shall be divided into the following classifications:
Class IA: Liquids having flash points below 73°F and having a boiling point below 100°F.

14.02: continued

Class IB: Liquids having flash points below 73°F and having a boiling point at or above 100°F.
Class IC: Liquids having flash points at or above 73°F and below 100°F.

Flammable Solid: A solid substance, other than one classified as an explosive, which is liable to cause fires through friction, through absorption of moisture, through spontaneous chemical changes, or as a result of retained heat from manufacturing or processing.

Flash Point: The minimum temperature in degrees Fahrenheit at which a flammable or combustible liquid will give off sufficient vapors to form an ignitable mixture with air near the surface or in the container, but will not sustain combustion. The flash point of a liquid shall be determined by appropriate test procedure and apparatus as specified in ASTM D56 and ASTM D93.

Marshal: the State Fire Marshal.

Person: Includes a corporation, firm, partnership, association, organization and any other group acting as a unit as well as individuals. It shall also include an executor, administrator, trustee, receiver or other representative appointed according to law.

14.03: Storage

(1) Except as otherwise provided for, no flammable or combustible liquids, flammable solids or flammable gases may be kept, stored, manufactured or sold without first obtaining, on an annual basis, a permit from the head of the fire department. The application for the permit shall clearly set forth the amounts of various flammable and combustible liquids, flammable solids or gases proposed to be kept or stored. The permit shall prescribe the conditions and specify the amounts to be kept or stored. The Head of the Fire Department may condition the issuance or renewal of any permit issued under 527 CMR 14.00, upon the completion of a satisfactory inspection by the head of the fire department or his/her designee to determine compliance with 527 CMR and M.G.L. c. 148.

Compliance with Federal Law Regarding Process Safety Management. Upon the application or renewal of any license, permit or registration issued pursuant to M.G.L. c. 148 or 527 CMR, relating to the keeping, storage, use, sale, handling, possession or processing involving any liquid, solid or gaseous compound, other than water, the head of the fire department may, as a condition to the issuance of said license, permit or registration, or renewal of said permit or continued activity thereunder, require documentation confirming compliance with the Federal requirements of 29 CFR 1910.119, relating to Process Safety Management of Highly Hazardous Chemicals, if applicable.

(2) In accordance with the provisions of M.G.L. c. 148, § 13, the following amounts, listed in Table 1, of flammable and combustible liquids, flammable solids or flammable gases may be kept, stored, manufactured or sold without obtaining a license from the local licensing authority.

Table 1

Class I liquids	793 gallons†
Class I liquids	10,000 gallons‡
Class II liquids	10,000 gallons
Class IIIA liquids	10,000 gallons
Class IIIB liquids	10,000 gallons
Flammable gases (within a building)	3,000 cubic feet
Flammable gases (outside a building)	10,000 cubic feet
Flammable solids	100 pounds

† In containers of 60 gallons capacity or less, or in portable tanks over 60 gallons capacity not intended for fixed use, including intermediate bulk containers (IBCs) designed for mechanical handling.

‡ In storage tanks having a liquid capacity that exceeds 60 gallons capacity, intended for fixed installation, and not used for processing.

14.03: continued

Note 1. The aggregate capacities of each separate class of flammable or combustible liquids shall be used when determining permit or license thresholds.

Note 2. When storing more than one class of liquid or other materials named in 527 CMR 14.03: *Table 1*, a license shall only be required for the individual class or materials, which exceed the amounts listed.

(3) If a license is required based on the limits set forth in 527 CMR 14.03: *Table 1*, a permit shall be obtained in accordance with 527 CMR 14.03(1).

(4) All flammable or combustible liquids, flammable solids or flammable gases for which a permit has been granted under 527 CMR 14.00 shall be kept or stored in such manner as the official granting the permit may prescribe.

(5) The head of the fire department may limit the quantity of flammable or combustible liquids, flammable solids or flammable gases that may be kept, stored, manufactured or sold under the authority of a permit to less than that specified in the foregoing table where, in his opinion, conditions are such as to warrant his restricting the amount of such fluids, solids or gases.

(6) Recognized tradesmen or artisans and those persons working under their supervision, will not be required to obtain a permit for the keeping and use of any flammable or combustible liquid or flammable gas, that do not exceed the limits listed in 527 CMR 14.03(6): *Table 2*, use in connection with such construction or repair, in any building or structure, provided said flammable or combustible liquid or flammable gas is removed from the building or structure upon the completion of each working day. A suitable fire extinguisher of at least 1A-10B:C rating shall be immediately available where flammable or combustible liquids or flammable gases are being kept or used. If any flammable or combustible liquids or flammable gases are not removed from the building or structure upon completion each working day or if the volume exceeds those listed in 527 CMR 14.03(6): *Table 2*, a permit shall be required in accordance with 527 CMR 14.03(1).

Table 2

Class 1 liquids, total volume	5 gallons
Flammable gases, total volume	40 cubic feet

(7) Whenever the flammable liquid or gases are to be used by the recognized tradesmen or artisans within two feet of the combustible material, adequate measures are to be taken to prevent the ignition of the adjacent combustibles by the use of resistive material between the flame and the combustible material.

(8) Gasoline may be used, kept, or stored in any building not used for habitation nor frequented by the public, without a permit, provided the total quantity shall not exceed seven gallons and provided the gasoline is stored in one or more approved containers. Approved containers shall include those built to U.S. DOT standards, listed and labeled by a NRTL, or approved by the State Fire Marshal. When not in use, containers shall be in a secured, upright position with all openings tightly closed. Such containers shall be kept away from all heating devices and shall not be opened in any area where there is an open flame or an electric or mechanical device that might cause a spark. If a container is used in an enclosed area, such area shall be suitably ventilated.

(9) All tanks, equipment, and apparatus and all piping, fittings and appliances used or intended to be used for the storage, handling, use or movement of flammable or combustible liquids shall be constructed, tested and approved in accordance with provisions of 527 CMR 9.00.

(a) Above ground tanks for the storage of flammable and combustible liquids shall comply with the provisions of 527 CMR 9.00 and 18.00.

(b) All existing and new above ground flammable and combustible liquids tanks located inside of a structure shall be provided with an approved automatic-closing heat actuated valve on each withdrawal connection below the liquid level as required by the provisions of 527 CMR 4.00 and 9.00.

14.03: continued

(c) The head of the fire department shall periodically inspect the existing above ground tank installations for safety, and if he determines that the installation or operation constitutes a hazard, he shall require unsafe tanks to be removed from service.
(d) Fuel oil tanks for supplying oil burning heating equipment and located above ground, inside or outside of the building, shall be installed in accordance with 527 CMR 4.00 and 9.00.
(e) When necessary for the safety of the general public, the head of the fire department may require greater separations or limit the storage capacity when the above ground tank installation is subject to severe exposure hazard or topographical conditions

(10) All tank vehicles used for the transportation of flammable or combustible liquids shall be designed, constructed, and operated in compliance with 527 CMR 8.00. No cargo tank, portable tank or transfer tank shall remain unattended unless the land on which it is left unattended is licensed or permitted in accordance with 527 CMR 8.04.

(11) All Class I flammable liquids, all Class II, and Class IIIA combustible liquids and all flammable gases kept for sale at retail shall bear a label with the words "DANGER -- KEEP AWAY FROM FIRE" or similar wording. The lettering on the labels required by 527 CMR 14.03 shall be at least as conspicuous as boldface standard type, in capital letters not less than 14 point in size for containers over four ounces. Containers of four ounces or less may have lettering not less than six point in size.

(12) The storage of flammable gases shall comply with the following conditions:
(a) Cylinders and pressure vessels shall be designed, constructed, tested and maintained in accordance with ANSI K61.1 and DOT 49 CFR.
(b) Each cylinder, pressure vessel or group of containers shall be marked with the name of the gas contained in accordance with DOT 49 CFR.
(c) Anhydrous ammonia shall be stored and handled in accordance with ANSI K61.1.
(d) All flammable gases shall be kept in approved cylinders which shall be adequately capped or regulated and secured to prevent falling or being knocked over. Such cylinders, when stored outside of buildings, shall be kept in a dry location not less than 50' from any building and shall be protected against direct rays of the sun, accumulations of ice and snow, and access by unauthorized persons.
(e) Gaseous hydrogen systems shall be installed and maintained in accordance with NFPA 50A.

(13) The storage of flammable solids shall comply with the recommended safeguards of the manufacturer and to the following standards as applicable:
(a) Storage, Handling, and Processing of Magnesium - NFPA 480
(b) Production, Processing, Handling and Storage of Titanium - NFPA 481
(c) Production, Processing, Handling and Storage of Zirconium - NFPA 482
(d) Manufacture of Aluminum and Magnesium Powder - NFPA 651
(e) Metals and Alloys - Loss Prevention Data Sheet 7-85

(14) All tanks used for the keeping, storage or dispensing of flammable liquids shall be subject to the approval of the head of the fire department and meet the provisions of 527 CMR 9.00.

(15) The storage of flammable and combustible liquids, in approved glass containers, in approved drums or other approved metal containers not exceeding 60 gallons individual capacity, and in approved portable tanks not exceeding 793 gallons individual capacity shall comply with the requirements of NFPA 30-2000; Section 4.2 Design, Construction and Capacity of Containers; Table 4.2.3 Maximum Allowable Size-Container, Intermediate Bulk Container, and Portable tanks, and 527 CMR 14.03 (16-21)
Exceptions:
(a) Flammable or combustible liquids in the fuel tanks of motor vehicle, aircraft, motor boat or stationary engine.
(b) Flammable or combustible liquids such as paint, oils, varnishes, or similar mixtures when stored for painting or maintenance or similar upon the premises and which are stored for a period not exceeding ten days.

14.03: continued

(16) Interior storage rooms shall be enclosed by a fire resistance rated assembly and constructed in accordance with the requirements of 780 CMR.

(17) Flammable and combustible liquids, including stock for sale, shall not be stored so as limit use of the means of egress of the building.

(18) The storage of flammable or combustible liquids in containers or portable tanks shall comply with the following references based on applicability. Except that the head of the fire department may impose a quantity limitation or require greater protection, where in his determination, a potential hazard to life or property exists.

(a) Assembly facilities classified in 780 CMR 302.1 as Group A-1 through A-4 shall comply with NFPA 30 Section 4.5.1Requirements for Liquid Storage in Other Occupancies and NFPA 30 Section 4.5.4 Assembly Occupancies, Buildings Containing More than Three Dwelling Units, and Hotels.

(b) Stadium and Amusement Assembly facilities classified in 780 CMR 302.1 as group A-5 shall comply with NFPA 30 Section 4.5.1Requirements for Liquid Storage in Other Occupancies and NFPA 30 Section 4.5.4 Assembly Occupancies, Buildings Containing More than Three Dwelling Units, and Hotels.

(c) Business, Educational, Institutional occupancies classified in 780 CMR 302.1 as groups B, E, Or I shall comply with NFPA 30 Section 4.5.5 Office, Educational, and Institutional Occupancies, and Day Care Centers

(d) Industrial/Commercial facilities classified in 780 CMR 302.1 as Group H-2 and H-3 shall comply with the following sections in NFPA 30-2000:

1. *Flammable storage utilizing hazardous material storage lockers*: Section 4.6 Hazardous Materials Storage Lockers
2. *Storage Cabinets*: Section 4.3 Design, Construction, and Capacity of Storage Cabinets
3. *Outside storage*: Section 4.7 Outdoor Storage
4. *Inside protected storage*: Section 4.4 Design Construction, and Operation of Inside Liquid Storage Areas and Section 4.8 Automatic Fire Protection for Inside Storage
5. *Inside unprotected storage*: Section 4.4 Design Construction, and Operation of Inside Liquid Storage Areas and Section 4.4.4 Allowable Quantities and Storage Heights, subsections 4.4.4.1, 4.4.4.2., 4.4.4.3, 4.4.4.4, and Table 4.4.4.1 Indoor Unprotected Storage of Liquids in Containers, Portable Tanks, and Intermediate Bulk Containers

(e) Mercantile occupancies classified in 780 CMR 302.1 as Group M, shall comply with NFPA 30, Section 4.5.6 Mercantile Occupancies.

(f) Dwellings, Residential, Hotel Buildings classified in 780 CMR 302.1 as group R-1 & R-2 shall comply with NFPA 30 Section 4.5.4 Assembly Occupancies, Buildings Containing More than Three Dwelling Units, and Hotels.

(g) Dwellings and Residential Buildings classified in 780 CMR 302.1 as Group R-2 & R-3 shall comply with NFPA 30 Section 4.5.3 Dwellings and Residential Buildings Containing Not More than Three Dwelling Units and Accompanying Attached and Detached Garages

(h) General purposes warehouse classified in 780 CMR 302.1 as group S-1 and S-2, shall comply with NFPA 30, Section 4.5.2 General-Purpose Warehouses

(19) Storage in buildings of use group M (Mercantile) shall comply with the following provisions: Non-flammable and non-combustible hazardous materials shall meet the following requirements: Oxidizers, Unstable Materials, Toxics, Highly Toxics, Corrosives, and Water.

Reactives shall be limited to: $Q = F \times A$
where 'Q' is the maximum quantity in a single control area for mercantile display. 'F' is the density factor as indicated in 527 CMR 14.03(19): *Table 3*. 'A' is the area occupied for mercantile display. For computation purposes, the area shall not exceed 1,500 square feet (139.39 m^2) per control area.

14.03: continued

Table 3. Density Factor for Hazardous Materials Exemption Calculation

Material	Class	Solids Pounds[1] (cubic feet)	Liquid gallons[1] (pounds)	Gas[1] (cubic fees)
		x 0.4536 for kg (x 28.32 for liters)	x 3.78 for liters (x 0.4536 for kg)	x 28.32 for liters
Oxidizers	4	Not permitted	Not permitted	Not permitted
	3	0.75	(0.75)	112.5
	2	1.5	(1.5)	9
	1	12	(12)	4.5
Unstable (reactive)	4	Not permitted	Not Permitted	Not Permitted
	3	0.375	(0.375)	3.75
	2	0.2	(0.3)	1.5
	1	Unlimited	Unlimited	2.25
Toxics	All	0.65	(0.65)	1.053
Corrosives	All	6.5	0.65	1.053
Highly Toxic	All	0.0013	(0.0013)	0.026
Water Reactive	3	0.375	(0.0375)	Not Applicable
	2	0.3	(0.3)	
	1	0.375	(0.375)	

1. Quantities may be increased by 100% in sprinklered buildings.

(20) Any facility that stores or manufactures aerosol products with a flammable propellant shall comply with the appropriate sections of NFPA 30B-1998.

14.04: Handling of Flammable Fluids

(1) Bulk processing or industrial plants, refineries or other plants and distilleries and all buildings, tanks and equipment used for the storage, processing, distillation, refining or blending of flammable or combustible liquids shall be located, constructed and used in accordance with 527 CMR 9.00 and 18.00.

(2) Class I flammable liquids shall not be dispensed by gravity from tanks, drums, barrels or similar containers. Approved pumps, taking suction from the top of the container shall be used except when the viscosity of the liquid makes such a restriction impractical. Class II, IIIA, and IIIB flammable or combustible liquids shall be drawn from tanks, drums or barrels by gravity through an approved self-closing valve or faucet which is affixed directly on the container or through a rigid closed piping system attached thereto.

(3) Flammable liquids shall not be dispensed by a device that operates through pressure within a storage tank, drum or container, unless the tank, drum or container has been approved as a pressure vessel for the intended use. Air or oxygen shall not be used to pressurize the approved vessel.

(4) Flammable liquids shall not be dispensed into a portable or stationary tank which does not meet the requirements of 527 CMR 9.00.

(5) Fuel pumps and fuel dispensers shall be installed in accordance with 527 CMR 5.00.

(6) Metal containers and portable metal tanks used for flammable and combustible liquids shall be electrically bonded or grounded during transfer of liquids in accordance with 527 CMR 12.00.

14.04: continued

(7) Flammable and combustible liquids used for the purpose of cleaning or degreasing shall comply with NFPA 34-2000.

(8) In locations where flammable vapors may be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition. Sources of ignition shall include open flames, lightning, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, and mechanical), spontaneous ignition, physical chemical reactions, and radiant heat. The head of the fire department shall prohibit the use of devices or order the suspension of an operation when proper precautionary measures are not taken.

(9) Flammable and combustible liquid spills and leaks shall be promptly reported to the head of the fire department and to the Office of Incident Response of the Department of Environmental Protection.

(10) No person shall permit or cause to be permitted the discharge of flammable or combustible liquids or any waste liquid containing petroleum or its products into or upon any street, pavement, highway, drainage canal ditch, storm or sanitary drain or flood control channel, lake or waterway, or upon the ground. All waste petroleum products shall be stored in accordance with 527 CMR 9.00: *Tanks and Containers* and shall be disposed of in accordance with 310 CMR 30.00: *Hazardous Waste* (Department of Environmental Protection).

14.05: Handling of Flammable Gases

(1) Cylinders containing flammable gases shall be stored, handled and used in accordance with the requirements of the head of the fire department.

(2) Piping systems shall not be used to distribute flammable medical gases or other flammable gases in any hospital or similar facility.

14.06: Handling of Flammable Solids

(1) Flammable solids shall be handled and used in accordance with the standards referred to in 527 CMR 14.03(14), if applicable.

(2) When no nationally recognized standard has been promulgated for the handling and use of a particular flammable solid, that solid shall be handled and used in accordance with the recommendations of the manufacturer.

14.07: Fire Control

(1) Suitable fire control devices, such as small hose or portable fire extinguishers, shall be available at locations where flammable fluids are stored.

(2) At least one portable fire extinguisher having a rating of not less than 40-B:C shall be located outside of but not more than six feet from the door opening into any interior storage room.

(3) At least one portable fire extinguisher having a rating of not less than 20-B:C shall be located not less than ten feet nor more than 25 feet from any flammable fluid storage area located outside of an interior storage room but inside the building.

(4) Open flames and smoking shall not be permitted in flammable and combustible liquid storage areas and conspicuous "NO SMOKING" signs shall be posted.

(5) Materials which will react with water shall not be stored in the same room with flammable or combustible liquids.

14.08: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 14.00 shall be considered a part of the requirements of 527 CMR 14.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 14.00: M.G.L. c. 148, §§ 9 and 10.

(PAGES 181 AND 182 ARE RESERVED FOR FUTURE USE.)

527 CMR 15.00: KEEPING, HANDLING AND TRANSPORTATION OF FLAMMABLE AND COMBUSTIBLE LIQUIDS, AND THE DISPOSITION OF CRUDE PETROLEUM OR ANY OF ITS PRODUCTS IN HARBORS OR OTHER WATERS OF THE COMMONWEALTH

Section

15.01: Application
15.02: Definitions
15.03: Storage
15.04: Handling, Transporting or Disposing
15.05: Piping, Valves, and Fittings for Marine Wharfs
15.06: Mobile Fuel Facility
15.07: Fuel Vessels and Barges
15.08: Vapor Recovery System
15.09: General Provisions
15.10: Referenced Publications

15.01: Application

(1) 527 CMR 15.00 applies to any flammable or combustible liquid pumping equipment, hoses, nozzles and appurtenances and any area within 25' of any pumping equipment, hoses, nozzles and other appurtenances used for delivering flammable or combustible liquids to or receiving flammable or combustible liquids from a fueling facility, mobile fueling facility (tank vehicle), fuel barge, fuel vessel, portable fuel tank and safety cans, including all facilities used in connection therewith.

(2) 527 CMR 15.00 shall not apply to:
(a) Liquefied Petroleum Gas Containers and Systems regulated by 527 CMR 6.00;
(b) Receiving, storing or distribution of flammable or combustible liquids by fuel barges or fuel vessels in Bulk Plant Loading and Unloading Facilities regulated by 527 CMR 18.00;
(c) Fuel barges and fuel vessels transferring flammable or combustible liquid cargoes utilizing a flange-to-flange closed transfer piping system as approved by Title 33 Code of Federal Regulations (CFR) 154;
(d) Vessels certified under Title 46, Code of Federal Regulations (CFR) and vessels or facilities certificated or regulated under Title 33 CFR 154, unless the certificated or regulated vessel or facility transfers or receives flammable or combustible liquid from a vessel or facility rated at less than 10,500 gallon capacity, or the vessel or facility acts as a marina or fueling facility that services pleasure vessels, fishing vessels, or tug boats;
(e) Foreign vessels regulated under Title 33 CFR 155 and U.S. and foreign public vessels, i.e. warships, naval auxiliaries or other ships owned and operated by a country when engaged in non-commercial service.

15:02: Definitions

For the purpose of 527 CMR 15.00, the following words shall have the meanings respectively assigned to them:

Approved, The approval of any equipment or materials based on compliance with accepted principles or recognized engineering practice, by a third party, nationally recognized testing laboratory, using standard test procedures or another recognized protocol, who shall publish a list or affix a label, certifying the suitability of the product to its intended use. Nationally recognized testing laboratories shall be approved by the Marshal, as laboratories suitable for evaluating equipment or materials of this type.

Approved Auxiliary Tanks, any listed or labeled auxiliary tank whose construction and components are compatible with its intended use and approved by the Marshal.

15.02: continued

Approved Fuel Hose, any listed or labeled fuel hose approved by the Marshal. Said hose shall be a rubber like material resistant to petroleum products and petroleum product additives, containing a continuous static ground, not exceeding 30' in length without the written approval of the head of the Fire Department and the Marshal. Where hose length at a marine fueling facility exceeds 30' the hose shall be secured by a hose retrieving mechanism so as to protect it from damage.

Approved Shut Off Control Valve, any listed or labeled valve whose construction and components are compatible with its intended use and approved by the Marshal.

Approved Portable Fire Extinguisher, any extinguisher with a 2A, 20-BC rating. The rating shall be in accordance with National Fire Protection Association (NFPA) 10, the Standard for Portable Fire Extinguishers.

Cargo Tank, any container having a liquid capacity of 119 gallons or more intended primarily for the carriage of flammable or combustible liquids, including appurtenances, reinforcements, fittings, and closures and which:

(a) is permanently attached to or forms a part of a motor vehicle, or is not permanently attached to a motor vehicle but which by reason of it size, construction or attachment to a motor vehicle is loaded or unloaded without being removed from the motor vehicle; and
(b) is not fabricated under a DOT specification for portable tanks; and
(c) does not solely supply fuel for the propulsion of the transport vehicle upon which it is mounted.

Combustible Liquid, Any liquid having a flash point at or above 100°F shall be known as a Class II or Class III Liquid. Combustible liquids shall be divided into the following classifications:

Class II: Liquids having flash points at or above 100°F and below 140°F.
Class IIIA: Liquids having a flash point at or above 140°F and below 200°F.
Class IIIB: Liquids having a flash point at or above 200°F.

Flammable Gas, Either a mixture of 13% or less (by volume) with air forms a flammable mixture or the flammable range with air is wider than 12% regardless of the lower limitation. These limitations shall be determined at atmospheric temperature and pressure.

Flammable Liquid, Any liquid having a flash point below 100°F and having a vapor pressure not exceeding 40 psia at 100°F Flammable liquids shall be known as Class I liquids and shall be divided into the following classifications:

Class IA: Liquids having flash points below 73°F and having a boiling point below 100°F.
Class IB: Liquids having flash points below 73°F and having a boiling point at or above 100°F.
Class IC: Liquids having flash points at or above 73°F and below 100°F.

Flammable Solid, A solid substance, other than one classified as an explosive, which is liable to cause fires through friction, through absorption of moisture, through spontaneous chemical changes, or as a result of retained heat from manufacturing or processing.

Flash Point, The minimum temperature in degrees fahrenheit at which a flammable or combustible liquid will give off sufficient vapors to form an ignitable mixture with air near the surface or in the container, but will not sustain combustion. The flash point of a liquid shall be determined by appropriate test procedure and apparatus as specified in ASTM D56 and ASTM D93.

Fuel Barge, any fuel vessel not equipped with means of self propulsion.

Fueling Facility, any pumping equipment, hoses, nozzles, and appurtenances and any area within 25' of any pumping equipment, hoses, nozzles and other appurtenances used for delivering flammable or combustible liquids to or receiving flammable or combustible liquids from a boat, vessel or barge, and shall include all facilities used in connection therewith.

15.02: continued

Fueling Facility Operations Supervisor, any responsible employee 18 years of age or older, that the fueling facility permit holder attests to be competent in the handling of flammable or combustible liquids and to be familiar with and to understand the contents of 527 CMR 15.00, and who is fully aware of the operation, mechanics and hazards inherent to the handling of flammable or combustible liquids and the fueling of vessels.

Fuel Vessel, any regulated boat or vessel especially constructed or converted to be used for the keeping, handling and transportation of flammable or combustible liquids and the disposition of crude petroleum or any of its products.

Harbor Master, any individual including assistant harbor masters appointed in accordance with the provisions of M.G.L. c. 102.

Inspector, any inspector or police officer of the Department of Public Safety or any person to whom the Marshal or the head of the Fire Department may delegate authority under M.G.L. c. 148.

Labeled, equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the Marshal, and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed, equipment or materials included in a list published by an organization acceptable to the Marshal, and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that equipment or materials meet appropriate standards or have been tested and found suitable for use in a specific manner.

Marine Wharf, any bulkhead, pier, wharf, dock or other structure and their appurtenances built along, abutting, over or contiguous to navigable waters or other water and used for the transfer of flammable or combustible liquids.

Marina or Pleasure Boat Berthing Area, any sheltered water area in a harbor provided with moorings, floats, and buoys for boats yachts and power marine craft including those places assigned to a vessel in port when anchored or laying alongside a pier or wharf.

Marshal, the State Fire Marshal.

Mobile Fuel Facility, Any tank truck or tractor and tank semi-trailer combination equipped with a cargo tank mounted thereon or built as an integral part thereof, used for the transportation of flammable or combustible liquids upon the highways, and functioning as a fueling facility.

Safety Can, a container of five gallons capacity or less having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure, and constructed and tested in accordance with either Underwriters Laboratories (UL) Standard 30 or Factory Mutual (FM) Standard 6051/6052, for the storage and handling of small quantities of flammable or combustible liquids. Safety cans must comply with 527 CMR 10.05.

Vessel, every description of watercraft used or capable of being used as a means of transportation.

15.03: Storage

(1) The provisions of 527 CMR 9.00, shall be complied with in so much as said provision do not conflict with the provisions of 527 CMR 15.00.

15.03: continued

(2) Every new or replacement tank and its piping system shall be upgraded, maintained and tested in accordance with the applicable provisions of 527 CMR 9.00: *Tanks and Containers*.

15.04: Handling, Transporting or Disposing

(1) No person shall keep, handle, store, or transport flammable or combustible liquids, or dispose of crude petroleum or any of its products on the waters of the Commonwealth except in accordance with 527 CMR 15.00.

(2) Flammable or combustible liquids shall not be kept, handled, stored or transported in any harbor or on other waters of the Commonwealth unless a permit has first been secured therefor from the Marshal.

(a) Application for the permit is to be made on Fire Prevention (FP) form 293, as revised.

(b) The permit shall be issued on Fire Prevention (FP) form 294, as revised.

(3) The permit provided for in the preceding section shall remain in force for a term to be determined by the Marshal unless suspended or revoked for cause by the Marshal, and shall be subject to examination at all times by any inspector, police officer, or harbor master within his jurisdiction.

(4) Flammable and combustible liquids and crude petroleum or any of its products kept on harbors or other waters of the Commonwealth shall be kept, transported, stored and/or delivered in fuel barges, fuel vessels, tank vehicles, tanks and containers specially designed, constructed or adapted for such purposes and approved by the Marshal.

(5) Any flammable or combustible liquid being transported on the waters of the Commonwealth other than by permanent supply tank shall be transported in approved auxiliary tanks or other approved safety cans. Such approved auxiliary tanks or safety cans shall have a combined capacity not to exceed 28 gallons. Any auxiliary tank or safety can larger than seven gallons must be blocked or secured in place to prevent any possibility of shift in position of more than two inches in any direction due to the motion of the vessel.

(6) No Class I flammable liquids shall be delivered to any vessel having its tanks located below deck unless each tank is equipped with a separate fill pipe, the receiving end of which shall be securely connected to a deck plate and fitted with a screw cap. Such pipe shall extend to and into the tank. Vessels receiving Class II or Class IIIA combustible liquids shall have the receiving end of the fill pipe securely connected to a deck plate and fitted with a screw cap. Such pipe may connect to a manifold fuel fill system which shall extend to and into each separate tank. Each flammable or combustible liquid tank shall be provided with a suitable vent pipe which shall extend from the tank to the outside of the coaming or enclosed rails so that the vapors will dissipate outboard.

(7) Vessel owners or operators shall not offer their craft for fueling unless;

(a) The tanks being filled are properly vented to dissipate fumes to the outside atmosphere and the fuel systems are liquid and vapor tight with respect to hull interiors.

(b) All fuel systems are designed, installed and maintained in compliance with the specifications of the manufacturer of the vessel.

(c) Communication has been established between the fueling facility operations supervisor and the person in control of the vessel receiving the flammable or combustible liquid so as to determine the vessel fuel capacity, the amount of flammable liquid on board, and the amount of flammable or combustible liquid to be taken on board.

(d) The electrical bonding and grounding systems of the vessel have been maintained in accordance with the specifications of its manufacturer.

(8) No flammable or combustible liquids shall be delivered to any storage tank by means of a pump or under pressure unless such storage tank is designed to withstand the additional stress to which it may be subjected during filling and the vent pipe for such tank is of sufficient size to safely relieve the tank of undue pressure.

15.04: continued

(9) No flammable or combustible liquids shall be delivered to the tank of any vessel from a storage tank, fuel vessel, fuel facility, mobile fueling facility, or marine wharf unless a competent person designated by the permit holder and trained by the employer as a fueling facility operations supervisor is present to supervise the operation during the entire period. Said designated and trained employee shall be familiar with the dispensing mechanism and emergency shut off controls and shall be within 15' of such dispensing controls during the fueling operation and shall remain within a direct clear unobstructed view of both the vessel fuel filler neck and the fueling facility emergency fuel shut off mechanism. Prior to the delivery of any flammable or combustible liquid the fueling facility operations supervisor shall insure that the vessel is properly moored and that all connections are made.

(10) No Class I flammable liquid shall be delivered to the tank of a vessel from a fueling facility except by means of an approved fuel hose equipped with an approved automatic shut off nozzle with the latch-open device defeated which shall be held open manually during delivery.

(11) Class II or Class IIIA combustible liquids shall be delivered to the tank of a vessel from a fueling facility either by 527 CMR 15.04(10) or by means of a flange-to-flange closed transfer piping system utilizing approved hose and full threaded connections or flanges that meet Standard B16.5, Steel Pipe Flanges and Flange Fittings or Standard B16.24, Brass or Bronze Pipe Flanges of the American National Standards Institute (ANSI) or quick connect couplings that are approved by the Marshal.

(12) A portable or fixed fill vent and signal device shall be securely affixed to the fuel filler pipe of the tanks receiving Class II or III flammable or combustible liquid to insure that the product is not overflowed.

(13) No flammable or combustible liquid shall be sold or delivered to the tank of any vessel or to any person by any form of unattended self-serve facility.

(14) No flammable or combustible liquids shall be delivered from a portable fuel container to the tank of any vessel with a fuel tank capacity greater than 28 gallons without the prior written approval of the head of the Fire Department. A single delivery of not more than seven gallons in the event of an emergency is excepted. All provisions of both 527 CMR 15.04(6) and (7) shall be complied with at the time of such delivery.

(15) Fueling shall never be undertaken at night except under well-lighted conditions.

(16) During fueling operations smoking shall be forbidden on board the boat or vessel and on the fueling facility.

(17) Before opening the tanks of the vessel to be fueled, the following precautions shall be observed;

(a) All engines, motors, fans and bilge blowers which are not explosion-proof shall be shut down.

(b) All open flames and smoking material shall be extinguished and all exposed heating elements shall be turned off.

(c) Galley stoves shall be extinguished.

(d) All ports, windows, doors and hatches shall be closed.

(e) The quantity of fuel to be taken aboard shall be determined in advance of fueling operations by the fueling facility operations supervisor in accordance with 527 CMR 15.04(7)(c).

(f) A sufficient number of fire extinguishers of a type approved by the Marshal shall be readily accessible.

(g) The fuel delivery nozzle shall be put into contact with the vessel fill pipe before the flow of fuel shall commence and this bonding contact shall be continuously maintained until fuel flow has stopped. There is a serious hazard from static discharge unless this rule is observed.

15.04: continued

(18) Tanks shall not be completely filled. Allow a minimum of 2% of tank space for expansion. This space allowance should be 6% if the fuel taken aboard is at a temperature of 32°F or below. After the fuel flow has stopped;

(a) The fill cap shall be tightly secured.
(b) Any spillage whatsoever shall be wiped up immediately.
(c) If Class I flammable liquid has been delivered, the entire vessel shall remain opened and bilge blowers turned on and allowed to run for at least five minutes before starting any engines or lighting galley fires. If bilge blowers are not available, an additional five minutes of venting shall be required.

(19) In the event of a leak, rupture, spill, overflow or other incident involving the handling of flammable or combustible liquids within 500 yards of the fuel facility both the Fire Department and the Marshal shall be notified immediately by the fueling operations supervisor or the permit holder.

(20) All vessel fueling operations shall be carefully accomplished in accordance with the 527 CMR 15.00 and utmost care shall be exercised during these operations.

(21) Conformance with the requirements of 527 CMR 15.04(1) through (20) shall be the responsibility of the vessel owner/operator, the permit holder and the on-site fueling facility operations supervisor who shall immediately terminate fueling operations if the provisions of 527 CMR 15.00 are not complied with.

15.05: Piping, Valves and Fittings for Marine Wharfs

(1) All piping systems shall be substantially supported and protected against physical damage and excessive stresses arising from impact, settlement, vibration, expansion, contraction, or tidal action.

(2) A readily accessible valve to shut off the flammable or combustible liquid supply from shore shall be provided in each fuel pipeline at or near the approach to the marine wharf and at the shore end of each fuel pipeline adjacent to the point where a flexible hose is attached. Each valve shall be marked "EMERGENCY FUEL SHUT OFF" in two inch red block capital letters.

(3) Pipe, valves, faucets, fittings and other pressure-containing parts of piping systems shall meet the material specifications, pressure and temperature limitations of ANSI B31.3-1980, Petroleum Refinery Piping. Nodular iron shall conform with American Society for Testing Materials (ASTM) A395-80, Ferric Ductile Iron Pressure Retaining Castings for Use at Elevated Temperatures. Flexible piping which is approved, certified as suitable for its intended use by the manufacturer, and provides product secondary containment shall meet the requirements of 527 CMR 15.05. Valves at storage tanks, as required by NFPA 30, (1993), Chapter 3, Piping Systems, shall be complied with in so much as said provisions do not conflict with the provisions of 527 CMR 15.00.

(4) A means shall be provided to assure flexibility of piping in event of excessive motion of wharfs. Flexible piping and swing joints shall be of an approved type designed to withstand the forces and pressures exerted upon piping.

(5) Pipelines on wharfs shall be adequately bonded and grounded according to the provisions of the Massachusetts Electrical Code if Class I liquids are handled. If excessive stray currents are encountered, insulating joints shall be installed. Bonding and grounding connections on all pipelines shall be located on the wharf side of hose riser insulating flanges, if used, and shall be accessible for inspection.

(6) Hose used in connection with filling tanks or the discharge of flammable or combustible liquids shall be approved fuel hose and shall be of sufficient length and properly supported to prevent undue strain thereto. In the filling of a fuel tank with flammable or combustible liquids a tight connection shall be made between the filling hose nozzle or discharge pipe and the filler pipe of the tank to be filled.

15.05: continued

(7) Marine wharves greater than 200 feet in length having a fueling facility shall be equipped with a minimum of four approved shut-off controls. One shut-off control shall be a pump switch which will be the control used by the operator to dispense the fuel under normal conditions (approved fuel delivery nozzle). The second shut-off control valve shall be located four feet from the base of the metering unit. The third shut-off control valve shall be located 15 feet from the metering unit. The fourth shut-off control valve shall be located on the shore side of the metering unit at a point where the piping system starts to extend over the water . The location of such approved shut-off control devices shall be familiar to the fueling facility operations supervisor. Said shut-off controls are to be marked "EMERGENCY FUEL SHUT OFF" in two inch red block capital letters and shall be accessible at all times.

(a) Marine piping systems shall contain a sufficient number of approved valves to control the flow of flammable or combustible liquid during normal operations and to provide adequate shut off protection in the event of fire or physical damage.

(b) Cast iron valves or fittings shall not be used in any pipe connection between the tank and dispensing nozzle.

(c) If a remote pumping system is used, a labeled or listed rigidly anchored emergency shut off valve incorporating a fusible link or other thermally actuated device, designed to close automatically in event of fire exposure or severe impact, shall be installed in accordance with the manufacturer's instructions in the flammable or combustible liquid supply line at the base of each individual dispenser or at the inlet of each overhead dispenser. The automatic closing feature of this valve shall be checked at least once a month by manually tripping the hold-open linkage. An emergency shut off valve incorporating a slip-joint feature shall not be used.

(8) At marine fueling facilities where tanks are at an elevation which produces a gravity head on the dispensing unit, the tank outlet shall be equipped with a device, such as a solenoid valve, positioned adjacent to, and downstream, so installed and adjusted that liquid cannot flow by gravity from the tank in case of piping or hose failure when the dispenser is not in use.

(9) Shutoff and check valves shall be equipped with a pressure-relieving device that will relieve any pressure generated by thermal expansion of the contained liquid back to the storage tank.

15.06: Mobile Fuel Facility

(1) All mobile fuel facilities shall comply with the provisions of 527 CMR 8.00, Transportation of Flammable and Combustible Liquids, in so much as said provisions do not conflict with the provisions of 527 CMR 15.00.

(2) No mobile fuel facility loaded with flammable or combustible liquids as defined in 527 CMR 15.00 shall be left unattended for more than one hour unless the driver notifies the head of the Fire Department in the city or town where the vehicle is parked. The head of the Fire Department may assume control of the vehicle and its contents if the driver or owner is unable or unwilling to remove the vehicle or its flammable or combustible contents within a reasonable time.

15.07: Fuel Vessels and Barges

(1) No fuel barge or fuel vessel shall be permitted to anchor or moor for fueling purposes within a marina or pleasure boat berthing area. A 200 foot radius marine fueling safety zone shall be maintained between the fuel barge or fuel vessel acting as a fueling facility and any marina or pleasure boat berthing area. This 200 foot radius marine fueling safety zone may be subject to written review by the head of the Fire Department in specific instances. The Marshal shall approve the marine fueling safety zone written review.

15.07: continued

(2) Fuel barges and fuel vessels shall be subject to assignment as to location by the harbor master in accordance with the authority vested in him by M.G.L. c. 102. When located on waters where no harbor master is provided, such assignment shall be made by the Marshal. The Marshal shall approve the permanent assignment of fuel barges and fuel vessels.

(3) Fuel barges, fuel vessels, and fueling facilities shall be open to inspection by the Marshal, an inspector, the head of the Fire Department, a harbor master having jurisdiction, or any person to whom the Marshal or head of the Fire Department may delegate authority.

(4) Flammable and combustible liquids kept for resale on fuel barges or fuel vessels shall be stored in metal tanks. Such tanks shall be constructed, braced and secured so as to prevent injury, rupture or displacement and to withstand the normal stresses to which they may be subjected. Tanks constructed in accordance with Code of Federal Regulations Title 46 CFR Part 30-40, subchapter D-Tank Vessels, will be considered as complying with the requirements of 527 CMR 15.07(4).

(5) Every fuel barge or fuel vessel used for the keeping of flammable or combustible liquids for resale and every fuel barge or fuel vessel used for the transportation of flammable or combustible liquids shall be identified by a name marked in clearly legible letters not less than four inches in height on some clearly visible exterior part of the port and starboard bow and the stern of that fuel barge or fuel vessel. The hailing port of such fuel barges and fuel vessels shall be marked in clearly legible letters not less than four inches in height on some clearly visible exterior part of the stern of the fuel barge or fuel vessel.

(6) Fuel barges and fuel vessels which in the opinion of the head of the Fire Department or the Marshal pose a substantial fire hazard due to the cargo they are carrying or the location they are moored shall rig fire warps. Fire warps shall consist of hawsers of sufficient size to take the barge or vessel under tow in the event of an emergency. Fire warps shall be secured to the deck of the barge or vessel and shall hang over the outboard side to within six feet of the surface of the water. An eye shall be spliced into the outboard end of the warp of sufficient size to permit the rapid attachment of a towing shackle.

(7) When receiving, discharging or storing flammable or combustible liquids, flammable solids or flammable gases, every fuel barge or fuel vessel shall display on a suitable staff an International Code Flag B which shall be readily discernible from a distance of not less than 1000' by day and shall be properly illuminated at night.

(8) Every fuel barge, fuel vessel or fueling facility used for the keeping of flammable or combustible liquids for resale shall be provided with such additional fire extinguishing appliances as may be prescribed by the Marshal.

(9) Smoking is prohibited on any fuel barge or fuel vessel used for the keeping of flammable or combustible liquids for resale and on any fuel barge or fuel vessel used for the transportation, storage or delivery of flammable or combustible liquids.

(10) All additional provisions of 527 CMR 15.00, must be complied with where applicable.

15.08: Vapor Recovery Systems

527 CMR 15.08 is left blank pending the development of Federal Regulation.

15.09: General Provisions

(1) All electrical components for dispensing flammable and combustible liquids shall be installed in accordance with Article 555, Marinas and Boat Yards of 527 CMR 12.00: *the Massachusetts Electrical Code.*

15.09: continued

(a) All electrical equipment installed and used must be in accordance with the Massachusetts Electrical Code as it applies to Wet, Damp, and Hazardous Locations.
(b) Clearly identified emergency switches readily accessible in case of fire or physical damage at any dispensing unit shall be provided on each marine wharf so interlocked as to shut off power to all pump motors from any individual location and to reset only from the master switch at the main electrical disconnect panel. Each such switch is to be identified by an approved sign stating "EMERGENCY PUMP SHUTOFF" in two inch red block capital letters.
(c) All electrical wiring for power and lighting shall be installed on the side of the marine wharf opposite from the flammable or combustible liquid piping system.

(2) The fueling facility shall be located so as to minimize exposure to all other operational marina or pleasure boat berthing area facilities. Where tide and weather conditions permit, all flammable and combustible liquid fuel handling shall be outside the main berthing area. Inside marina or pleasure boat berthing area, fueling facilities shall be so located that in case of fire aboard a boat alongside, the danger to other boats near the facility will be minimal. No vessel or craft shall be made fast to or berthed at any marine wharf, except during fueling operations, and no vessel or craft shall be made fast to any other vessel or craft occupying a berth at a marine wharf, or other fueling facility.

(3) Fueling of floating marine craft at other than a fueling facility is prohibited except by prior written authorization by the head of the Fire Department.

(4) Materials shall not be placed on marine wharfs in such a manner as to obstruct access to fire fighting equipment or important piping system control valves. Where the marine wharf is accessible to vehicular traffic an unobstructed roadway to the shore end of the wharf shall be maintained for access by fire fighting apparatus.

(5) Water standpipe systems with approved 1½ inch hose connections shall be provided at marine wharfs for emergency fire protection. A Class III standpipe system shall be installed on all marine wharfs which extend more than 500' from the shore line. The standpipe system and related fire department connections shall be installed and tested in accordance with NFPA 14, the Standard for the Installation of Standpipe and Hose Systems. In addition, approved portable fire extinguishers shall be provided within 75' of areas requiring fire protection.

(6) A copy of the provisions contained in 527 CMR 15.04(6) through 15.04(21) inclusive and the following excerpt from M.G.L. c. 148 shall be conspicuously posted under glass on fuel barges and fuel vessels and at all fueling facilities:

M.G.L. c. 148, § 10B, as amended. "Any person who knowingly violates any rule or regulation made by the Board of Fire Prevention Regulations shall, except as otherwise provided, be punished be a fine of not less than one hundred dollars nor more than one thousand dollars."

(7) A suitable sign with the following legends printed in two inch red block capital letters on a white background shall be conspicuously posted at the dispensing area of all fueling facilities;

BEFORE FUELING:
(a) Stop all engines and auxiliaries.
(b) Shut off all electricity, open flames, and heat sources.
(c) Check all bilges for fuel vapors.
(d) Extinguish all smoking materials.
(e) Close access fittings and openings that could allow fuel vapors to enter enclosed spaces of the vessel.

DURING FUELING:
(a) Maintain nozzle contact with fill pipe.
(b) Wipe up spills immediately.
(c) Avoid overflowing.
(d) Fuel filling nozzle must be attended at all times.

15.09: continued

AFTER FUELING:
(a) Inspect bilges for leakage and fuel odors.
(b) Ventilate until odors are removed.

(8) A registered professional engineer shall submit complete scaled plans and specifications of each proposed new fueling facility installation to the head of the Fire Department. All blueprints, plans and specifications shall be approved by the head of the Fire Department as to compliance with the provisions of 527 CMR 15.00, before any new installation is commenced. The plans and specifications shall provide the following information;

(a) The exact name of the fueling facility and the address where it will operate.
(b) Whether the construction is new or a conversion of an existing facility.
(c) The layout of the following; the pier; the storage tanks; the piping system transporting flammable and combustible liquids from the storage tanks to the dispensing site; the location and path of the electrical static grounding system; the location and type of water standpipe system; the location of the nearest hydrant; the trade name, type and location of the piping system, flexible hose, couplings, control valves, and swing and swivel joints. A notation on the plan legend shall indicate the location and type of fire extinguishing systems, fuel dispensing nozzles, and the maximum number of dispensing nozzles which can be operated simultaneously.
(d) A statement that the blueprints, plans and specifications of the installation comply with the requirements of the provisions of 527 CMR 15.00.
(e) The date the original license (M.G.L. c. 148, § 13) was issued with restrictions, if any, and the name of the current license holder. A photostatic copy of the license and registration issued under M.G.L. c. 148, § 13, shall be attached. If a copy of the license is not available, a notarized letter from the city or town licensing authority shall be furnished. The notarized letter shall list all the information provided on the original license including type, amount and method approved for storage of flammable and combustible liquid(s), and any restrictions attached to the license.

(9) Fueling facility installations shall comply with the minimum material and installation standards set forth in NFPA 30, Flammable and Combustible Liquids Code and NFPA 30A, Automotive and Marine Service Station Code.

(10) Liquefied Petroleum Gas (LPG) cylinders shall not be filled, discharged or stored within 200' of a flammable or combustible liquid fueling facility.

(11) No construction, maintenance, repair or reconditioning work involving the use of open flames or arcs or spark-producing devices shall be performed at any fueling facility.

(12) No person shall pump, discharge, deposit, throw or spill, or cause to be pumped, discharged, deposited, thrown or spilled into or on the waters of any lake, pond, river, creek or brook, or into any public sewer or drainage system within the jurisdiction of this Commonwealth, or into or on the waters within three miles of the shore of this Commonwealth, any crude petroleum or its products or any other flammable or combustible liquid, or any bilge water, or any water or any sewage containing any of the said substances.

(13) All fueling facilities shall be maintained in a neat and orderly manner and no accumulations of excess amounts of rubbish or waste oils shall be permitted.

15.10: Referenced Publication

Documents or portions thereof that are referenced within 527 CMR 15.00 shall be considered a part of the requiremetns of 527 CMR 15.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 15.00: M.G.L. c. 148, §§ 9, 10, 38E and 38H.

527 CMR 16.00: MODEL ROCKETS

Section

16.01: Adoption by Reference
16.02: Modification of Provisions of NFPA 1122
16.03: Modification of Provisions of NFPA 1127
16.04: Referenced Publications

16.01: Adoption by Reference

NFPA 1122, Code for Model Rocketry, 2002 Edition.
NFPA 1127, Code for High Power Rocketry, 2002 Edition.

16.02: Modification of Provisions of NFPA 1122

For the purpose of 527 CMR 16.00, the provisions of NFPA 1122 shall be modified as follows:

(1) Chapter 3 Definitions: The definitions of Approved and Authority having jurisdiction shall be revised to read:

Approved: Approved by the Marshal.

Authority Having Jurisdiction: The State Fire Marshal.

(2) Section 4.20.3 Residential Storage of Model Rocket Motors and Motor Components. Section 4.20.3 shall be revised to read: Storage of more than 50 pounds net weight of solid propellant model rocket motors, reloading kits, or motor components at a residence shall require a permit from the head of the fire department.

16.03: Modifications of the Provisions of NFPA 1127

For the purpose of 527 CMR 16.00, the provisions of NFPA 1127 shall be modified as follows:

(1) Chapter 3 Definitions: The definitions of Approved and Authority having jurisdiction shall be revised to read:

Approved: Approved by the Marshal.

Authority Having Jurisdiction: The State Fire Marshal.

(2) Section 4.19 Storage of High Power Model Rocket Motors, Motor Reloading Kits, and Pyrotechnic Modules shall be revised by adding the following new section.

4.19.6. Permits. A permit issued by the head of the fire department shall be required for the storage of High Power Model Rocket Motors, Motor Reloading Kits, and Pyrotechnic Modules.

16.04: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 16.00 shall be considered a part of the requirements of 527 CMR 16.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 16.00: M.G.L. c. 148, § 10.

(PAGES 195 THROUGH 198 ARE RESERVED FOR FUTURE USE.)

527 CMR 17.00: LUMBER AND OTHER FOREST PRODUCTS

Section

17.01: Adoption by Reference
17.02: Referenced Publications

17.01: Adoption by Reference

NFPA 46, Recommended Safe Practice of Forest Products.

17.02: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 17.00 shall be considered a part of the requirements of 527 CMR 17.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

(PAGES 201 AND 202 ARE RESERVED FOR FUTURE USE.)

527 CMR 18.00: FLAMMABLE LIQUIDS IN BULK PLANT LOADING AND UNLOADING FACILITIES

Section

18.01: Definitions
18.02: Bottom Loading Facilities
18.03: Referenced Publications

18.01: Definitions

(1) For the purpose of 527 CMR 18.00, the following terms shall have the meanings respectively assigned to them:

Approved, approved by the Marshal.

Bulk Plant shall mean that portion of a property where flammable or combustible liquids are received by tank vessel, pipe lines, tank car or tank vehicle, and are stored or blended in bulk for the purpose of distributing such liquids by tank vessel, pipe line, tank car or tank vehicle.

Flammable Liquid, any liquid normally in a liquid state which, when heated to a certain degree of temperature, will emit a vapor which will ignite by flame or spark. In 527 CMR 18.00 flammable liquids are divided into the following classes:

Class A (highly flammable liquids), any flammable liquid having a flash point below 100°F, to be ascertained by any standard closed-cup instrument.

Class B (less flammable liquid), any flammable liquid having a flash point of not less than 100°F nor higher than 187°F to be ascertained by any standard closed-cup instrument.

Class C (relatively safe flammable liquids), any flammable liquid having a flash point above 187°F to be ascertained by any standard closed-cup instrument.

Marshall, the State Fire Marshall.

Tank Car, a cargo tank mounted on a railroad chassis.

Tank Truck, any single self-propelled motor vehicle equipped with a cargo tank mounted thereon, and used for the transportation of flammable liquids.

Tank Vehicle, any tank truck, or tractor and tank semitrailer combination.

Valves. Valves used for the final control for filling tank vehicles shall be of the self-closing type and manually held open except where automatic means are provided for shutting off the flow when the vehicle is full or after filling of a preset amount.

(2) Separation of Facilities. Tank Vehicle and Tank Car loading or unloading facilities shall be separated from above ground tanks, warehouses, other plant buildings or nearest line of adjoining property that may be built upon by a distance of 25' for Class A liquids and 15' for Class B and Class C liquids measured from the nearest position of any fill spout. Buildings for pumps or shelters for personnel may be a part of the loading or unloading facility.

780 CMR shall not apply to loading or unloading facilities in existence prior to the effective date of 527 CMR 18:00 unless the continued use of such facility, in the judgment of the head of the fire department, would constitute an undue fire or explosion hazard.

(3) Separation of Equipment. Equipment such as piping, pumps and motors used for the transfer of Class A liquids between storage tanks and the fill stem of the loading rack shall not be used for the transfer of Class B or Class C liquids.

18.01 continued

(5) Static Protection.

(a) Bonding facilities for protection against static sparks during the loading of tank vehicles through open domes shall be provided where Class A or Class B liquids are loaded, or where Class C liquids are loaded into vehicles which may contain vapors from previous cargoes of Class A or B liquids.

(b) Protection as required in 527 CMR 18.01(5)(a) shall consist of a metallic bond wire permanently electrically connected to the fill stem or to some part of the rack structure in electrical contact with the fill stem. The free end of such wire shall be provided with a clamp or equivalent device for convenient attachment to some metallic part of electrical contact with the cargo tank of the tank vehicle.

(c) Such bonding connections shall be made fast to the vehicle or tank before dome covers are raised and shall remain in place until filling is completed and all dome covers have been closed and secured.

(d) Bonding as specified in 527 CMR 18.01(5)(a), 18.01(5)(b) and 18.01(5)(c) is not required where vehicles are loaded exclusively with products not having a static accumulating tendency such as asphalt, most crude oils and residual oils and water soluble liquids.

(e) Filling through open domes into the tanks of tank vehicles or tank cars that contain vapor air mixtures within the flammable range or where the liquid being filled can form such a mixture, shall be by means of a downspout which extends near the bottom of the tank. This precaution is not required when loading liquids which are non-accumulators of static charges.

(f) When asphalt, crude oils, residual oils or other distillates are loaded into any tank vehicle or tank car which last contained liquids capable of forming vapor air mixtures within flammable range at or below normal ambient temperatures the extended downspout referred to in 527 CMR 18.01(5)(e) shall be required and flow rate shall be restricted until the downspout opening is submerged.

(g) Tank car loading facilities where Class A liquids are loaded through open domes shall be protected against stray currents by bonding the pipe to at least one rail and to the rack structure if of metal. Multiple lines entering the rack area shall be electrically bonded together. In addition, in areas where excessive stray currents are known to exist, all pipe entering the rack area shall be provided with insulating sections to electrically isolate the rack piping from the pipelines. No bonding between the tank car and the rack or piping is required during either loading or unloading of Class C liquids.

(6) Buildings.

(a) Rooms in which flammable or combustible liquids are stored or handled by pumps shall have exit facilities arranged to prevent occupants being trapped in the event of fire. The head of the fire department may designate the number and location of such exits.

(b) Rooms in which Class A liquids are stored or handled shall be heated only by means not constituting a source of ignition such as steam or hot water. Rooms containing heating appliances involving sources of ignition shall be located and arranged to prevent entry of flammable vapors.

(c) Ventilation shall be provided for all rooms, buildings or enclosures in which Class A liquids are pumped or dispensed. Design of ventilation systems shall take into account the relatively high specific gravity of the vapors. Ventilation may be provided by adequate openings in outside walls at floor level, unobstructed except by louvers or coarse screens. Where natural ventilation is inadequate, mechanical ventilation shall be provided and installed in accordance with NFPA 91.

(7) Electrical Equipment.

(a) All electrical equipment and wiring shall be of a type specified by and installed in accordance with the provisions of the Massachusetts Electrical Code, 527 CMR 12.00. Special attention is directed to 527 CMR 5.00.

18.01: continued

(b) 527 CMR 18.01(7)(a) shall apply to areas where Class A liquids are stored or handled. For areas where Class B or Class C liquids only are stored or handled, the electrical equipment may be installed in accordance with the provisions of the Massachusetts Electrical Code, 527 CMR 12.00, for ordinary locations.
(c) Class A liquids shall not be handled, drawn or dispensed where flammable vapors may reach a source of ignition. Smoking shall be prohibited except in designated safe areas approved by the head of the fire department. Conspicuous signs with the words "NO SMOKING" in block letters four inches in height shall be posted in all areas where the hazard from flammable vapors may be expected to be present.

(8) Drainage and Waste Disposal.
(a) Provisions shall be made to prevent flammable or combustible liquids which may be spilled at loading or unloading points from entering public sewers and drainage systems or natural waterways. Connections to such sewers, drains or waterways by which flammable or combustible liquids might enter shall be provided with separator boxes or other approved means whereby such entry is precluded. Crankcase drainings and flammable or combustible liquids shall not be dumped into sewers but shall be stored in tanks or tight drums outside of any building until removed from the premises and disposed of in a manner satisfactory to the head of the fire department. The head of the fire department shall be guided by the Hazardous Waste Regulations of the Division of Water Pollution Control, Water Resources Commission Pamphlet 6672, Promulgated by the Mass. Dept. of Public Health.

(9) Fire Protections.
(a) Suitable fire control devices such as small hose or portable fire extinguishers of not less than 20-BC rating shall be available to locations where fires are likely to occur. The head of the fire department may order additional fixed fire protection equipment for loading rack areas. Additional fire control equipment may be required where a tank of more than 50,000 gallons individual capacity contains Class A liquids and where an unusual exposure hazard exists from surrounding property. Such additional fire control equipment shall be sufficient to extinguish a fire in the largest tank. The design and amount of such equipment shall be in accordance with approved engineering standards.
(b) When overhead sprinkler systems are installed at loading racks they shall be designed to actuate by means of a flame detector located over each bay or by an approved thermal detector provided the efficiency of such a detector is not affected by normal ambient temperature changes.
(c) Suitable hand hose attached to a water supply shall be provided for the manual wash down of spills in the loading area.

(10) Damage Protection.
(a) Access to loading bays shall be controlled by concrete bumpers or pipe guide rails so that no part of any vehicle entering the bay can come in contact with the loading structure or its equipment.
(b) Sufficient clearance shall be provided under top loading facilities and its related structure to allow for the highest vehicle expected to pass through the structure.

18.02: Bottom Loading Facilities

(1) Specification of 527 CMR 18.01. 527 CMR 18.01 shall apply to Bottom Loading Facilities unless specifically excluded or clearly nonapplicable.

(2) Control Valves.
(a) Control valves shall be installed to automatically provide for an initial slow opening rate of flow prior to attaining full rate of flow.
(b) Maximum-rate-of-flow controllers shall be incorporated to limit the maximum rate at which the meter is to be loaded.

18.01: continued

(c) Slow closing rate of flow shall be incorporated to minimize line shock and may be accomplished by use of control valves, quantity presets, or both.
(d) Bottom loading assemblies shall incorporate a dry break coupling connection to the truck compartment with interlocking connections so that the valve cannot be opened until the connection is locked to the adapter and cannot be disconnected until the valve is closed.

(3) Damage Protection.
(a) Loading couplers shall incorporate a fracture point in the coupler itself to prevent damage to the vehicle connection if vehicle is moved prior to disconnecting the loading assembly.
(b) Provisions shall be made to keep bottom loading assemblies and equipment from extending into traffic lanes when not in use.

18.03: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 18.00 shall be considered a part of the requirements of 527 CMR 18.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 18.00: M.G.L. c. 148, §§ 9 and 10.

527 CMR 19.00: TENTAGE

Section

19.01: Definitions
19.02: Scope
19.03: General Requirements
19.04: Referenced Publications

19.01: Definitions

For the purpose of 527 CMR 19.00, the following word shall mean:

Tentage, any mobile or portable temporary shelter designed to protect persons from the elements, all or a portion of the covering of which is made of fabric or other pliable materials. This includes but is not limited to the following: camping tents, play tents, fold-out tents and campers, pop-up tents and camping trailers, recreational vehicle awnings, dining flies and canopies, fabric on screen houses, add-a-rooms, and ice fishing tents.

19.02: Scope

(1) The design and construction of tentage with floor areas 120 square feet or less shall comply with 527 CMR 19.00.

(2) The design and construction of tentage with floor areas in excess of 120 square feet shall comply with 780 CMR.

(3) The operation and use of all tents shall comply with the applicable sections of 248 CMR, 527 CMR, and 780 CMR.

19.03: General Requirements

(1) No person shall sell or keep for sale any tentage as such term is defined in 527 CMR 19.00 unless all pliable material contained therein passes the applicable tests described in NFPA 701 or otherwise conforms to 527 CMR 19.03(4).

(2) Each lot of flame retardant material accepted by any wholesale or retail distributor of tentage within the Commonwealth shall be accompanied by a written certification from the supplier stating that it meets the flame retardance requirements of NFPA 701 and giving the lot number and yardage therein.

(3) A label or labels containing the following information shall be permanently affixed to each item of tentage:
(a) Certification: A statement that the materials used in the manufacture of the item meet the flame retardance requirements of NFPA 701.
(b) Manufacturer's Identification: An identification of the manufacturer of the item unless the item bears a private label, in which case it shall identify the private labeler and shall also contain a code mark which will permit the seller of the item to identify the manufacturer thereof to the purchaser upon request.
(c) Serial Number: A number enabling the manufacturer to identify, from his records, the supplier and supplier's lot number of the material used in the item. The manufacturer shall also maintain records identifying the person or firm to whom he sold each numbered item. He shall further maintain records identifying those items manufactured from each lot of certified material for a period of four years.
(d) Care Information: Precautionary instructions designed to protect the item from agents or treatments known to be detrimental to the flame retardant properties of the material and to warn against the introduction of high heat sources.

(4) Tentage which is not manufactured or fabricated in accordance with NFPA Standard 701, and is not certified and labeled in conformance with 527 CMR 19.03(2) and 19.03(3) may be manufactured, sold, or kept for sale within the Commonwealth, provided:

19.03: continued

(a) That each item of tentage bears a conspicuous label with the words:
"CAUTION -- FLAMMABLE MATERIAL -- DO NOT EXPOSE TO FLAME, SPARK, OR ABNORMAL HEAT SOURCE";

(b) That each box, carton or other outer packaging of tentage bears a label with like warning as required by 527 CMR 19.03(4)(a).

(c) That the lettering on the labels required by this rule shall be at least as conspicuous as bold-faced standard type in capital letters not less than 24 point in size and its background shall be of sharply contrasting color;

(d) That the labels required by 527 CMR 19.03 shall be securely and permanently affixed to the item of tentage and outer packaging.

19.04: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 19.00 shall be considered a part of the requirements of 527 CMR 19.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 19.00: M.G.L. c. 148, §§ 10 and 28.

527 CMR 20.00: USE AND MAINTENANCE OF TEMPORARY PORTABLE SPACE HEATING DEVICES AND EQUIPMENT USED IN THE CONSTRUCTION INDUSTRY

Section

20.01: General
20.02: Salamanders
20.03: Referenced Publications

20.01: General

(1) For the purpose of 527 CMR 20.00 the following words shall have the meanings respectively assigned to them:

Employee, an employee who, by training, education, or experience, is capable of performing his assigned work safely and efficiently.

Fuel, Liquid, a flammable or combustible liquid as defined in 527 CMR 14.00, in the liquid state consisting of a petroleum base.

Fuel, Solid, a combustible material in the solid state below its ignition temperature.

Liquefied Petroleum Gas, LP-gas, includes any material which is composed predominantly of any of the following: Hydrocarbons or a mixture of them; propane; probylene; butanes (normal butane or isobutane); and butylenes.

Manufacturer, a heater manufacturer.

Marshall, the State Fire Marshal.

Nationally Referenced Testing Laboratory (NRTL). An organization which tests for safety and lists, labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00: *Appendix C*.

Salamander, a temporary and portable space heating device used for the drying of construction material.

Stability, the ability of a heater to withstand overturning forces.

(2) No salamander or stove for drying any construction material shall be used in any building except:
- (a) under such conditions as may be prescribed by the Board.
- (b) with a permit issued by the head of the fire department.

(3) No salamander, stove, or other portable heater for drying construction material shall be used in any building unless such device has been listed and labeled by an NRTL.

(4) Each heater unit shall have permanently affixed to it a conspicuous and permanently legible safety data plate. The data plate(s) shall provide data on:
- (a) Side and top clearances from combustible materials.
- (b) Minimum air requirements for fuel combustion.
- (c) Type of fuel to be used and the operating input pressure at the burner.
- (d) Instructions for lighting, extinguishing, and relighting.
- (e) Electrical power supply characteristics such as voltage range, amperage, phase, cycle, and type of current.

(5) Heaters used in the vicinity of tarpaulins, canvas, or similar coverings shall be located a safe distance from coverings and other combustible materials. The coverings shall be securely fastened to prevent ignition of the covering or upsetting of the heater due to wind action on the covering or other material.

20.01: continued

(6) Heaters shall not be moved, handled, or serviced while hot or burning or while component parts are hot to the touch. The data plate described in 527 CMR 20.01(4) or a second conspicuously visible plate shall be labeled with the words:

DO NOT MOVE, HANDLE, OR SERVICE WHILE HOT OR BURNING.

(7) The safeguards engineered into the device shall be maintained and repairs shall be performed in accordance with the manufacturer's recommendations. Replacement parts shall be equal to, the equivalent of, or the same as the original heater equipment.

(8) Heaters, when in use, shall be set level with the horizontal unless otherwise permitted by the manufacturer's markings. The heater shall be designed so as not to tip over when placed on a surface inclined 25° to the horizontal. If equivalent protection and safety is afforded by alternative design, the 25° limitation may be reduced.

(9) Heaters, when in use, shall be protected to prevent flame extinguishment.

(10) Salamanders, stoves, or heaters shall be refueled only by a person trained in such operations.

20.02: Salamanders

(1) Solid fuel, *i.e.*, coal, coke, wood burning salamanders are prohibited.

(2) LP-gas fueled salamanders shall be installed and operated in accordance with the provisions of 527 CMR 6.00 and 248 CMR.

(3) Each time a salamander is placed in operation it shall be checked to insure that it is functioning properly and its operation shall be checked periodically thereafter. When concentrations of carbon monoxide attain quantities greater than 50 parts per million (0.005 percent) to air volume at employee breathing levels, the salamander shall be extinguished unless additional natural or mechanical ventilation is provided to reduce the carbon monoxide content to permissible limits.

(4) Tests for presence of carbon monoxide shall be made by a qualified person within one hour after the start of each work shift and at least every three hours thereafter. If concentrations of carbon monoxide reach 30 parts per million to air volume, tests shall be made more frequently to determine if there is a continuing increase of carbon monoxide concentration. Records of all tests, including the date, time, results obtained, and person making tests, shall be maintained for a seven-day period.

(5) Salamanders shall be located and operated in accordance with 527 CMR 20.00, and the manufacturers instructions.

(6) No employee shall be permitted to enter the heated area until notification is given to another person located outside. Periodic checks of at least one every 15 minutes shall be made to insure the safety of employees entering the heated area.

(7) When a salamander is being used, the responsibility for its operation and maintenance shall be assigned to a qualified employee. Salamanders shall not be moved or handled while hot or burning or while component parts are hot to the touch.

(8) Fresh air shall be supplied in sufficient quantities to maintain the safety of employees. Where natural means of fresh air supply is inadequate (less than 16% oxygen by volume), mechanical ventilation shall be provided. Particular attention shall be given to confined spaces and pockets where heat and fumes may accumulate and employees may be present.

(9) Only a one-day supply of heater fuel shall be stored inside a building in the vicinity of the salamander. General fuel storage shall be outside the structure. All fuel storage shall be maintained a minimum of 25' from any source of ignition.

20.03: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 20.00 shall be considered a part of the requirements of 527 CMR 20.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 20.00: M.G.L. c. 148, §§ 9 and 10.

NON-TEXT PAGE

527 CMR 21.00: DECORATIONS, CURTAINS, DRAPERIES, BLINDS AND OTHER WINDOW TREATMENTS

Section

21.01: Definitions
21.02: General Requirements
21.03: Test Method for Decorations
21.04: Test Method for Curtains, Draperies, Blinds and Other Window Treatments
21.05: Referenced Publications

21.01: Definitions

For the purpose of 527 CMR 21.00 the following words shall have the meanings respectively assigned to them:

Approved: Unless otherwise indicated, listed or approved by a nationally recognized testing laboratory (NRTL).

Blind: Anything that keeps out light when placed in a window but not including ordinary window shades. Included are venetian blinds, vertical blinds and other synthetic materials.

Curtain: A piece of cloth or other material, sometimes arranged so that it can be drawn upward or sideways, hung for decoration, as at a window, or to cover, conceal, or shut off something.

Decorations: All materials such as scenery, plastic shields, streamers, and also cloth, cotton batting, straw, vines, leaves, trees and moss used for decorative effect, bamboo and other wood fibers, cardboard and other paper products.

Drapery: Hangings or coverings arranged in loose folds or an artistic arrangement of such hangings or coverings.

Enclosed Spaces: Those spaces within an occupancy that are completely separated from public spaces by a "smoke barrier." Included are hotel rooms, individual apartments, and enclosed offices.

Flammable Decoration: Any decoration as defined in 527 CMR 21.01(1) shall be classified as a flammable decoration if it exhibits an afterflame greater than two seconds or an afterglow greater than 40 seconds when tested according to the methods described in 527 CMR 21.03(1) through (4).

NR: No Requirement.

Nationally Recognized Testing Laboratory (NRTL). An organization which tests for safety and lists, labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00 (Appendix C).

Public Spaces: Those spaces within an occupancy accessible by the public while the building is occupied. This shall include all components of the means of egress such as exit accesses and exits.

Smoke Barrier: A continuous membrane, either vertical or horizontal, such as a wall, floor, or ceiling assembly and solid opening protection such as solid doors and windows, that is designed and constructed to restrict the spread of smoke. A smoke barrier may or may not have a fire resistance rating. Opening protective devices (doors for example) shall be self- or automatic-closing.

21.02: General Requirements

(1) Materials regulated by 527 CMR 21.00 shall not be purchased, leased or rented for use in a particular occupancy unless the intended user has been provided with certification from an approved fire test laboratory that the regulated material conforms with the applicable provisions of 527 CMR 21.00.

21.02: continued

(2) The head of the fire department shall be provided with a copy of the certification required by 527 CMR 21.02(1) and a notice that fire test reports and related documentation which demonstrate the certified compliance are available on request.

(3) Where a topical flame retardant finish, not of a permanent nature, is applied to a decoration, curtains, draperies, etc., a certificate of such treatment and a sample of the treated decoration, curtains, draperies, etc. shall be filed with the head of the fire department. The certificate shall be renewed whenever the decoration, curtains, draperies, etc. are laundered or dry-cleaned.

(4) Additions or modifications to existing decorations, curtains, draperies, etc. using approved materials may be made without bringing the remaining decorations, curtains, draperies, etc. into conformance with 527 CMR 21.00.

(5) 527 CMR 21.00 shall apply to occupancies in accordance with Table 1 and Table 2. Where indicated in Table 1 by the word "Yes," only decorations that are not classified as "flammable decorations" or that have passed the applicable test(s) described in NFPA 701 shall be allowed. Where indicated in Table 2, the curtains, draperies, blinds and other window treatments shall pass the referenced test method(s). Occupancies are defined by 780 CMR.

(6) Special Seasonal Decorations: When it can be shown to the head of the fire department that generic materials such as cardboard, paper or textiles can meet the requirements of 527 CMR 21.00 when treated with a flame-retardant process, those specific generic materials shall not be required to have a specific testing and certification.

The end user shall apply for a permit from the head of the fire department for the use of Special Seasonal Decorations. A certification shall be provided that the Special Seasonal Decorations have been treated with a flame-retardant process which will render generic materials being used as Special Seasonal Decorations so that they will be in compliance with 527 CMR 21.00.

Documentation shall be made available to the head of the fire department which shall demonstrate compliance with 527 CMR 21.00.

(7) No materials regulated by 527 CMR 21.00 shall be so placed as to obstruct exits, access thereto, egress therefrom, or visibility thereof.

21.03: Test Method for Decorations

(1) Six specimens, each measuring 1½ inches by ten inches shall be cut at random from the submitted sample when feasible.

(2) Each specimen shall be suspended vertically for ten seconds with its lower end in contact with the top of the flame of a Tirrell burner which has been adjusted so that the blue cone of the flame is approximately 1½ inches high and the total height of the flame is six inches.

(3) After removal of the flame from the specimen its afterflame and afterglow shall be observed.

(4) If a portion of the specimen melts off during exposure to the test of flame, the burner shall be raised so as to maintain contact between the flame and specimen for a total time of ten seconds. The duration of burning of the melted off portion of the specimen shall be noted and considered to be afterflame in any evaluation of the flammability of the specimen.

(5) An alternative method of compliance is to pass the applicable test(s) described in NFPA 701.

21.04: Test Method for Curtains, Draperies, Blinds, and Other Window Treatments

(1) The test methods employed shall be those specified NFPA 701.

21.04: continued

(2) The tested items shall be conditioned prior to testing as specified in the referenced test method.

TABLE I
DECORATIONS

APPROVAL REQUIRED UNDER 527 CMR 21.00

Occupancy	Decorations Test or NFPA 701
A - Assembly (all sub-groups)	
public space	Yes
enclosed space	Yes
B - Business	
public space	Yes
enclosed space	NR
E - Educational	
public space	Yes
enclosed space	Yes
F - Factory and Industrial	NR
H - High Hazard	NR
I - Institutional (all sub-groups)	
public space	Yes
enclosed space	Yes
M - Mercantile	
public space	Yes
enclosed space	NR
R - Residential, R-1	
public space	Yes
enclosed space	Yes
- Residential, R-2	
public space	Yes
enclosed space	NR
- Residential, R-3 and R-4	
public space	Not Applicable
enclosed space	NR
- Residential, R-5	
public space	Not Applicable
enclosed space	Yes
S - Storage	NR
U - Utility and Miscellaneous	NR

21.04: continued

TABLE 2
CURTAINS, DRAPERIES, ETC.
APPROVAL REQUIRED UNDER 527 CMR 21.00

Occupancy	Test Method
A - Assembly, A - 1	
public space	NFPA 701
enclosed space	NFPA 701
- Assembly, A - 2	
public space	NFPA 701
enclosed space	NFPA 701
- Assembly, A - 3	NFPA 701
- Assembly, A - 4	NFPA 701
- Assembly, A - 5	NFPA 701
B - Business	
public space	NFPA 701
enclosed space	NR
E - Educational	
public space	NFPA 701
enclosed space	NFPA 701
F - Factory and Industrial	NR
H - High Hazard	NR
I - Institutional (all sub-groups)	
public space	NFPA 701
enclosed space	NFPA 701
M - Mercantile	
public space	NFPA 701
enclosed space	NR
R - Residential, R-1	
public space	NFPA 701
enclosed space	NFPA 701
- Residential, R-2	
public space	NFPA 701
enclosed space	NR
- Residential, R-3 and R-4	
public space	Not Applicable
enclosed space	NR
- Residential, R-5	
public space	Not Applicable
enclosed space	NFPA 701
S - Storage	NR
U - Utility and Miscellaneous	NR

Note: Tentage 120 sq. ft. or less shall comply with 527 CMR 19.00 and tentage greater than 120 sq. ft. shall comply with 780 CMR.

21.05: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 21.00 shall be considered a part of the requirements of 527 CMR 21.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 21.00: M.G.L. c. 148, §§ 10 and 28.

527 CMR 22.00: CANNON OR MORTAR FIRING

Section

22.01: Purpose and Scope
22.02: Definitions
22.03: Permits
22.04: Certificates of Competency
22.05: Range Conditions and Other Prefiring Requisites
22.06: Magazines and Powder
22.07: Firing of Cannons
22.08: General Provisions

22.01: Purpose and Scope

(1) 527 CMR 22.00 governs the firing of muzzle-loading cannons during patriotic celebrations and re-enactments, and covers all such artillery ranging from pre-Revolutionary War vintage to present-day facsimiles. This revised edition is effective January 1, 1984.

(2) 527 CMR 22.00 shall not apply to any cannon exhibit only and in which explosives are not being used.

(3) Ammunition for cannon shall be considered a Class C explosive when kept, handled, used, or transported for the purpose of cannon or mortar firing, provided such ammunition is in the form of prepackaged charges which do not exceed a total quantity of 20 pounds. In all other cases, ammunition for cannon, which is a Class B explosive, shall be subject to all the requirements therefor contained in 527 CMR 13.00.

22.02: Definitions

The following terms shall have the meanings assigned to them unless the context clearly indicates otherwise:

Blank-fire. The supervised discharge of cannon or mortar without projectile.

Cannon. Any gun designed to be fired from a carriage resting on the ground and which is loaded from the muzzle with non-rigid black powder charges.

Competent Operator. Any able-bodied person at least 21 years of age who holds a current certificate of competency for cannon firing from the State Fire Marshal.

Display. The supervised discharge of cannon or mortar, whether blank-fire without projectile, or live-fire with projectile.

Head of the Fire Department. As defined in M.G.L. c. 148, § 1.

Live-fire. The supervised discharge of cannon or mortar with projectile.

Marshal. The State Fire Marshal.

Mortar. Any cannon whose length is less than six times its bore diameter, or any cannon fired at an elevation of 45° or more from the horizontal.

22.03: Permits

(1) A permit for the supervised firing of cannon shall be issued by the head of the fire department on permit forms furnished the fire departments by the Department of Public Safety.

22.03: continued

(2) Application for permit shall be submitted to the head of the fire department in the municipality where the supervised firing is to take place not less than 15 days in advance of firing date, and shall state whether blank-fire or live-fire. Submission of this application is a guarantee that the cannons to be fired will be inspected by the competent operator and meet all safety requirements prior to firing.

(3) Upon receipt of application, the head of the fire department shall make an investigation of the pertinent facts set forth in application for the purpose of determining compliance with all provisions of law and of 527 CMR 22.00. Upon completion of the investigation, but not later than five days after receipt of application, the head of the fire department shall transmit one copy of application to the Marshal and one copy to the applicant with his endorsement thereon in compliance with provisions of law, or his reason for withholding such endorsement.

(4) No permit shall be issued for the supervised discharging of cannon with or without projectile unless the applicant exhibits a Certificate of Competency for Cannon Firing.

(5) No permit granted for a specific display shall be transferable.

22.04: Certificates of Competency

(1) Every supervised firing of a cannon with or without projectile shall be handled by a competent operator at least 21 years of age who holds a current Certificate of Competency for Cannon Firing issued by the Marshal.

(2) Any person desiring to obtain a Certificate of Competency shall make application in writing to the Marshal and shall submit to such examination and test as the Marshal may prescribe. Such certificate when issued shall continue in effect for a period of five years, and may be renewed without examination upon prior written request of the holder, provided it has not been suspended or revoked by the Marshal.

(3) Any violation of 527 CMR 22.00 or the terms of a permit may be cause for immediate revocation of Certificate of Competency.

22.05: Range Conditions and Other Prefiring Requisites

(1) No cannon shall be fired with ball, shot or projectile unless a permit for live-firing has been obtained from the head of the fire department and only on ranges approved by the head of the fire department. Such ranges shall be clear and unobstructed between discharge point and target area and for a safe distance to the rear of target in event of an overshoot. The target area shall not exceed 250 yards from the point of discharge.

(2) There shall be no permanent building, public highway, railroad, or other public way within the forward sector of a 180° arc having a radius of 100' from the muzzle of the cannon. A similar sector of 180° directed toward the rear 50' in radius shall be clear of all public ways, permanent buildings, or other obstructions.

(3) It shall be the responsibility of the competent operator to determine that the area in which the display is to be conducted is safe and that all operations are conducted in compliance with the requirements of 527 CMR 22.00. The competent operator, head of the fire department, the Marshal, or his authorized representative may order postponement of the display for any violation of 527 CMR 22.00.

(4) No discharging of any cannon shall be permitted during any windstorm in which the direction and velocity of the wind renders the display dangerous to the public safety and/or surrounding property.

22.05: continued

(5) There shall be no discharging of cannon between the hours of sunset and sunrise without prior written approval from the head of the fire department.

(6) The head of the fire department shall designate the location and type of fire extinguishing equipment as may be required.

(7) No firing of any cannon may be conducted unless the crew is present in adequate numbers and is fully trained.

(8) No member of the gun crew shall be under 18 years of age.

(9) Smoking shall be prohibited in the discharge area.

(10) No person shall be allowed in the forward or flank zone of the muzzle of a cannon firing a projectile within a forward sector of 120° having a radius of 150% of the estimated range of the piece. No person shall be within 100' of the remaining area in the 180° sector forward of the muzzle.

(11) The audience at a supervised blank- or live-firing of cannon shall be restrained behind lines 50' on the flank area back of the muzzle and 50' to the rear of the gun.

(12) Unless otherwise allowed by the Marshal, no piece shall be discharged with blank ammunition unless all spectators are at a safe distance from the front of the piece and at least 50' to the rear or flank. Adjacent pieces must be at a safe interval.

22.06: Magazines and Powder

(1) All ammunition for cannon shall be transported and temporarily stored at the firing location in the finished state in a portable magazine. Such magazine shall be constructed of at least 24-gauge sheet metal lined with a minimum of ¾" marine plywood or other non-sparking material, and shall be of sturdy sealed construction held together with non-sparking fastenings. A suitable lock and hasp of non-sparking material shall be provided.

(2) In the discharge area, a ready-service box constructed of wood with non-sparking fastenings and cover designed to be self-closing shall be positioned at ground level approximately 20' to the rear of the piece being served with the hinges toward the piece.

(3) All magazines and ready-service boxes shall be closed prior to the loading of each charge of the piece being served and adjacent pieces. Ready-service boxes for each gun should contain the minimum number of cartridges required for the gun during that particular display. Magazines and ready-service boxes shall at all times be under the control of a competent member of the gun crew.

(4) No loose or bulk powder other than priming powder in quantities not exceeding ½ ounce shall be used in the firing of any cannon, and no loose or bulk powder shall be transported or stored in any portable magazine with charges.

(5) All charges shall be made up of commercially manufactured black powder only, and such charges prepared for the demonstration firing shall be made of completely combustible material or a non-combustible material such as foil. The completely combustible charge shall be encased in aluminum foil or other spark-proof material which shall be removed at the muzzle of the cannon in the case of display firing. No wadding of any kind is permitted in blank firing.

(6) The amount of black powder used in each charge shall be such as to not present an undue hazard to persons, property, or the piece itself.

22.06: continued

(a) In no case shall any charge for cannons exceed four ounces of power per inch of bore diameter.
(b) Powder charges for mortars shall not exceed four ounces per inch of chamber diameter.

22.07: Firing of Cannons

(1) No torch or open-flame device shall be used to ignite any charge to be fired from a cannon.

(2) All cannons used to fire a projectile shall be provided with an instant source of ignition such as an electrical squib or bridge wire or percussion cap or other approved instant firing device.
Exception to the foregoing shall apply to the use of fuses for the firing of mortars.

(3) No firing of any cannon shall be conducted unless the weapon contains a seamless steel safety sleeve and has been magnafluxed or tested by other means to insure it is in safe operating condition. Original guns including original brass or bronze guns without safety sleeves may be used provided they have been tested by magnafluxing or X-ray or other equivalent procedure.

(4) Projectiles shall not be so constructed as to develop any unsafe pressures; and no combustible, explosive, or pyrotechnic projectiles may be used.

(5) The maximum rate of fire of any cannon shall not exceed one round in three minutes. Reloading shall not commence until a minimum of two minutes has elapsed since the worming and wet sponging has been completed after firing.

(6) The piece shall be wormed and wet sponged between shots and the vent stopped from the time the worm enters the muzzle until the rammer is removed from the bore after the cartridge is rammed in blank-firing, or the projectile is rammed in live-firing.

(7) At no time shall any cannon be moved or left unattended while loaded or during a misfire until the piece has been cleared.

(8) In the event of a misfire, the following steps shall be taken by the competent operator:
(a) The gunner shall give an audible warning.
(b) No personnel shall approach the front of the muzzle.
(c) A mandatory three minute cooling off period shall be observed.
(d) The piece shall be reprimed from a safe position and a repeated attempt made to fire the piece.
(e) If the attempt to refire the piece is unsuccessful, the piece shall be flooded with water through the vent and allowed to soak for a period of at least one hour unless the water or compressed gas can be used to flush the charge out of the muzzle.
(f) The projectile and/or charge shall be removed through the muzzle.

(9) If, after a display, the competent operator has reason to believe that there are any unignited charges or remnants thereof containing explosives in the area, he shall make a thorough search of the area for such explosives. The responsibility for disposition of same shall be assumed by the competent operator.

22.08: General Provisions

(1) Any explosion, fire, or other accident occurring in connection with the keeping, storage, manufacture, handling, transportation, supervised display or other disposition of ammunition for cannon causing loss of life or injury to any person or damage to property shall be immediately reported to the Marshal by the competent operator, giving a detailed account of same and confirmed in writing.

REGULATORY AUTHORITY

527 CMR 22.00: M.G.L. c. 22, § 14; c. 148, §§ 9 and 10.

NON-TEXT PAGE

527 CMR 23.00: ISSUANCE OF CERTIFICATES FOR THE SERVICING OF PORTABLE FIRE EXTINGUISHERS AND THE INSTALLING AND SERVICING OF FIXED FIRE EXTINGUISHING SYSTEMS

Section

23.01: Purpose
23.02: Applicability of Regulations
23.03: Definitions
23.04: Certificate of Registration
23.05: Certificate of Competency
23.06: Issuance and Renewal of Certificates; Fees;
23.07: Service Tags
23.08: Suspension or Revocation of Certificate
23.09: Annual Report on Employees

23.01: Purpose

The purpose of 527 CMR 23.00 is to regulate the issuance of certificates for the recharging, charging, servicing, inspection, and testing of portable fire extinguishers; the alteration, repair, recharging, testing, inspection, installation, and servicing of engineered and pre-engineered fixed fire extinguishing systems; and the performing of hydrostatic testing of fire extinguisher pressurized containers.

23.02: Scope and Applicability

(1) 527 CMR 23.00 shall apply to all firms and individuals engaged in the business of servicing portable fire extinguishers, the installation and/or servicing of fixed fire extinguishing systems, and the performing of hydrostatic testing.

(2) The provisions of 527 CMR 23.00 do not apply to the following:
(a) The filling or charging of a portable fire extinguisher by the manufacturer prior to its initial sale.
(b) The servicing by a firm of its own portable extinguishers or fixed systems by its own personnel specially trained for such servicing.
(c) The installation or servicing of water sprinkler systems installed in compliance with 780 CMR (the Massachusetts State Building Code).
(d) Firms engaged in the selling at wholesale or retail of portable fire extinguishers but not engaged in the installation or recharging of same.
(e) Fire department recharging of portable fire extinguishers as a public service where no charge is made, provided that the fire department member is trained in the proper filling and recharging of the fire extinguishers.

23.03: Definitions

For the purpose of 527 CMR 23.00, the following terms (words) shall have the meanings respectively assigned to them:

Alteration, an addition or change in an engineered or preengineered fixed fire extinguishing system which is not a replacement of a part or unit of the same capacity and design.

Approved, approved by the Marshal.

Charge, the filling or refilling of any portable fire extinguisher or engineered or preengineered fixed system with a chemical, fluid, or gas for the extinguishing of fires.

Engineered systems, those requiring individual calculation and design to determine flow rates, nozzle pressures, quantities of agent, and the number and type of nozzles and their placement in a specific system.

23.02: continued

Fee, a monetary exaction imposed or collected by the Department of Public Safety in connection with a prerequisite or condition for the issuance and/or renewal of any required certificate.

Firm, any person, partnership, corporation, or association.

Fixed fire extinguishing system, those approved fire extinguishing systems designated as approved by the Marshal. Where used in 527 CMR 23.00, the term shall include both engineered and pre-engineered fire extinguishing systems.

Hydrostatic testing, pressure testing by approved hydrostatic methods of fire extinguishers and/or pressurized containers which are components of fire extinguishing systems.

Marshall, the State Fire Marshall.

Portable fire extinguisher, a device which is capable of being readily moved from place to place, and which contains within it chemicals, fluids or gases for extinguishing fires and the means for application of its contents to that purpose.

Pre-engineered fixed systems, those extinguishing systems having predetermined flow rates, nozzle pressures, and quantities of extinguishing agents. These systems have the specific pipe lengths, number of fittings, and number and type of nozzles listed by a nationally recognized testing laboratory based on actual fire tests.

Recognized testing laboratory, a nationally recognized testing agency staffed by qualified personnel and properly equipped to conduct the appropriate tests and furnish inspection and re-examination services and who publish lists of tested materials, equipment or devices, and conduct inspections, examinations and tests of the most recent production of the listed products. Recognized testing laboratories must be approved by the Marshal.

Service, servicing, the charging, filling, maintaining, recharging, refilling, repairing, altering, inspecting, testing, and tagging of portable fire extinguishers and fixed fire extinguishing systems, and/or the hydrostatic testing of portable and fixed fire extinguishing systems.

23.04: Certificate of Registration

(1) Each firm engaged in the business of charging, recharging, servicing, testing, and inspection of portable extinguishers and/or the alteration, repair, recharging, charging, and servicing of fixed fire extinguishing systems, and in the performing of hydrostatic testing must have a Certificate of Registration issued by the Marshal.

(2) Certificates of Registration (CR) shall be any one or more of the following types:
- (a) Type 42 - Servicing portable fire extinguishers.
- (b) Type 43 - Servicing engineered fixed fire extinguishing systems.
- (c) Type 44 - Servicing pre-engineered fixed fire extinguishing systems.
- (d) Type 45 - Hydrostatic testing of fire extinguishers manufactured in accordance with the specifications and procedures outlined by the Marshall.
- (e) Type 40 - Self-Serve Motor Fuel Facilities.

(3) Application for Certificate of Registration shall be made in writing to the Marshal on forms provided by him, accompanied by the appropriate fee. The application must be signed by the sole proprietor or each partner or by an officer of the corporation or association. A copy of Certificate of Registration will be provided by the Marshal for each separate location of such firm.

(4) No Certificate of Registration of any type shall be issued by the Marshal until:

23.04: continued

(a) The Marshal or his designee has by inspection determined that the applicant possesses approved equipment required for the type certificate sought. The Marshal shall give the applicant a reasonable opportunity to correct any deficiencies discovered by the inspection.
(b) The Marshal has determined that the granting of renewing of a Certificate of Registration would not be contrary to public safety and welfare.
(c) The required fee has been paid.

(5) No Certificate of Registration of any type shall be issued to any person who is under 18 years of age.

(6) Each Certificate of Registration shall be identified by type and shall bear an identifying number delineated as MA-CR-(number), the "MA" indicating it is a Massachusetts certificate. The type certificate shall be determined on the basis of the act(s) performed by the certified.

(7) Every Certificate of Registration issued shall contain the following information:
- (a) Name and address of firm
- (b) Certificate number, MA-CR-(number)
- (c) Type of Certificate (42, 43, 44, 45, 40)
- (d) Date issued
- (e) Date of expiration
- (f) Signature of the Marshal

(8) Every Certificate of Registration issued pursuant to the provisions of 527 CMR 23.00 shall be posted on the premises of the certified location for inspection at any reasonable hour by the Marshal or his designee.

(9) A duplicate Certificate of Registration may be issued by the Marshal to replace one lost or destroyed upon receipt by the Marshal of a written statement from the certified firm attesting to the fact that the Certificate of Registration has been lost or destroyed.

(10) Evidence of alteration of any Certificate of Registration shall render said certificate invalid, and altered certificate shall be surrendered to the Marshal or his designee. Any change of location of any certified firm shall be reported to the Marshal in writing within 15 days of such change by the certified firm to maintain validity of the affected Certificate of Registration.

(11) No Certificate of Registration issued pursuant to 527 CMR 23.00 shall be transferred from one firm to another or from one person to another.

(12) Any sign, listing, or advertisement of a certified firm shall state the type of certificate and the certificate number, MA-CR-(number).

(13) No Certificate of Registration of any type shall constitute authorization of any holder of a Certificate of Registration or any employee thereof to enforce any provision of 527 CMR 23.00.

(14) No Certificate of Registration of any type shall constitute authorization for any certified firm or any of its employees to enter upon or into any property or building.

(15) Every certified firm shall be staffed by qualified personnel holding Certificates of Competency provided for elsewhere in 527 CMR 23.00.

(16) Every certified firm shall be properly equipped to perform the act or acts as permitted by the type of certificate(s) issued.

23.05: Certificate of Competency

(1) Each person engaged in the servicing of portable fire extinguishers and/or engineered or pre-engineered fixed fire extinguishing systems, or in the performing of hydrostatic testing, must have a Certificate of Competency issued by the Marshal.

(2) Types of Certificates of Competency for which an applicant may qualify are as follows:
(a) Type 46 - Servicing portable fire extinguishers only.
(b) Type 47 - Servicing engineered fixed fire extinguishing systems.
(c) Type 48 - Servicing pre-engineered fixed fire extinguishing systems.
(d) Type 49 - Hydrostatic testing of cylinders.
(e) Type 41 - Self-Serve Motor Fuel Facilities.

(3) Application for Certificate of Competency by any person employed by a certified firm shall be made in writing to the Marshal on forms provided by him to perform such service as is authorized by the type of certificate sought.

(4) An application for a Type 47 and a Type 48 Certificate of Competency shall be accompanied by a written attestation enumerating the applicant's technical qualifications, competency, and experience to charge, recharge, repair, test, inspect, and service engineered or pre-engineered systems.

(5) Every person desiring a Certificate of Competency may be required to take and pass a written examination to determine his fitness to hold such certificate. Applicant may also be required to give demonstration of his knowledge and skill. Such written examinations and demonstrations shall be developed and administered by the Marshal, and shall be held at such places and times as he may determine.

(6) The written examination shall test applicant's ability, knowledge, and skill as may be applicable to the type certificate being sought, as generally indicated in the listing below. These written examinations shall consist of multiple-choice, fill-in, true-false, or short answer questions, and may include or consist of diagrams, plans or sketches.
(a) Portable fire extinguishers: charging, recharging, servicing, testing, and inspecting.
(b) Engineered fixed fire extinguishing systems: charging, recharging, altering, repairing, testing, inspection, installation, and servicing.
(c) Pre-engineered fixed fire extinguishing systems: Same as for 527 CMR 23.05(6)(b).
(d) Hydrostatic testing: Self-explanatory.
(e) Self service fire extinguishing systems.

(7) No Certificate of Competency of any type shall be issued by the Marshal until:
(a) The Marshal has determined that the granting or renewing of such Certificate would not be contrary to public safety and welfare.
(b) The required fee has been paid.

(8) No Certificate of Competency of any type shall be issued to any person who is under 18 years of age.

(9) Every Certificate of Competency shall indicate the type of act or acts to be performed and for which the applicant has qualified, and by a number delineated as MA-CC-(number), the MA indicating it is a Massachusetts certificate.

(10) Every Certificate of Competency issued shall contain the following information:
(a) Name and address of applicant
(b) Certificate number, MA-CC-(number)
(c) Type of certificate (46, 47, 48, 49, 41)
(d) Date of birth
(e) Social Security number
(f) Photograph (supplied by applicant)
(g) Date of expiration
(h) Signature of applicant

23.05: continued

(11) A duplicate Certificate of Competency may be issued by the Marshal to replace one lost or destroyed upon receipt by the Marshal of a written statement from the certified person attesting to the fact that the Certificate of Competency has been lost or destroyed.

(12) Any change in the home address of any holder of a Certificate of Competency shall be reported in writing to the office of the Marshal within 15 days of such change.

(13) Every person holding a valid Certificate of Competency shall, upon demand, show and permit the examination of such Certificate by the Marshal, head of the fire department, or their designees.

(14) No Certificate of Competency issued pursuant to 527 CMR 24.00 shall be transferred from one person to another.

(15) No Certificate of Competency of any type shall constitute authorization for any person to enter upon or into any property or building.

(16) No Certificate of Competency shall constitute authorization for any person to enforce any provision of 527 CMR 24.00 or to misrepresent the use for which certificate was intended.

23.06: Issuance and Renewal of Certificates; Fees

(1) All Certificates shall be valid throughout the Commonwealth for a period of two years from date of issue. The original and renewal fees for any certificate issued pursuant to 527 CMR 24.00 will be in accordance with M.G.L. c. 7, § 3B.

(2) Application for renewal of a Certificate of Registration or a Certificate of Competency shall be made every two years. Such renewal application, accompanied by the appropriate fee, shall be submitted in person or by certified mail at least one month in advance of the expiration date. If the Marshal or his designee fails to act on such certificate renewal within thirty days, the certificate shall remain in force until a new certificate is issued or the applicant is rejected for cause.

(3) All acts of service performed after the expiration date of the Certificate of Registration or Certificate of Competency shall be in violation of 527 CMR 23.06 except as noted in 527 CMR 23.05(2).

23.07: Service Tags

(1) One service tag shall be attached to each portable fire extinguisher or engineered or pre-engineered fixed fire extinguishing system or to a vessel which has been hydrostatically tested. Tag shall be attached in such a position as to be conveniently inspected and in such a way that the operation of the equipment will not be hampered.

(2) Prior to printing, each firm holding a valid Certificate of Registration shall forward one sample of service tag to the Marshal for approval.

(3) Approved service tags shall include the following information, with 527 CMR 23.07(3)(a) through (f) appearing on the front of the tag:

(a) The words "Do Not Remove Per Order of the State Fire Marshal" on the top front of tag.
(b) Servicing firm's name and address.
(c) Firm's Certificate of Registration MA-CR number and type.
(d) Type of service performed.
(e) Date service performed.
(f) Certificate of Competency number of qualified individual who performed or supervised the service(s) performed and his initials.

23.07: continued

(g) Space and lines for recording owner and location of equipment.
(h) Space and lines for recording type and size of extinguisher.

(4) Every approved service tag attached to a portable or fixed fire extinguishing system after January 1, 1980, shall conform to 527 CMR 23.00.

(5) The service tag shall indicate the date, initials, and certificate number of the person who conducted the most recent test.

(6) Any engineered, pre-engineered, and self-service fire suppression system inspected and found to be in non-compliance, with its listing or manufacturers specifications, shall have a service tag attached indicating non-compliance.
(a) Non-compliance service tags shall be bright orange, have the words "Non-Compliance", and contain the firm name, Certificate of Registration number, date of inspection, the reason for non-compliance, and the initials and Certificate of Competency number of the person who conducted the inspection. The words "Non-Compliance" shall consist of block letters not less than one half inch in height, black in color.
(b) The head of the fire department and the fire marshal shall be notified in writing, by the firm conducting the inspection, within 48 hours of the inspection identifying the fire suppression system in non-compliance and the reasons thereof.
(c) The head of the fire department and the state fire marshal shall be notified in writing, by the firm conducting the service, within 48 hours of the completion of the work to bring the system into compliance.

23.08: Suspension or Revocation of Certificate

(1) Failure of any certified person or firm to perform the act(s) for which certified in accordance with good engineering practice will subject that person or firm to summary suspension by the Marshal or his representative of certificate(s) held. Such certificate(s) may be reinstated after hearing.

(2) Any Certificate of Registration or Certificate of Competency regardless of type may be revoked or suspended by the Marshal for a violation by the certificate holder of any of 527 CMR 23.00.

23.09: Required Annual Report on Employees

(1) The holder of a current valid Certificate of Registration shall report in writing annually the name, address, Certificate of Competency number (CC) of each certified person in his employ.

REGULATORY AUTHORITY

527 CMR 23.00: M.G.L. c. 148, § 58.

527 CMR 24.00: FIRE WARNING SYSTEMS INSTALLED IN BUILDINGS WITHIN THE COMMONWEALTH OF MASSACHUSETTS

Section

24.01: Purpose
24.02: Scope
24.03: Definitions
24.04: Approval of Design
24.05: Power Supply Sources
24.06: Equipment Performance
24.07: Installation
24.08: Maintenance and Testing
24.09: Acceptance

24.01: Purpose

The purpose of 527 CMR 24.00 is to provide basic minimum standards for the installation, operation, and maintenance of automatic smoke and heat detectors that are required in certain buildings pursuant to M.G.L. c. 22, § 14; and M.G.L. c. 148, §§ 10 and 28. The installation of these devices is intended primarily for the protection of life by indicating abnormal conditions and secondarily to summon assistance.

24.02: Scope

(1) 527 CMR 24.00 covers minimum design, performance, location, mounting, testing, and maintenance requirements of automatic smoke/ heat detectors and systems for protection of the occupants of certain buildings in accordance with the stated purposes. Said design, installation, testing and maintenance of said system shall be in compliance with NFPA 72, National Fire Alarm Code 1996 edition.

(2) Nothing in 527 CMR 24.00 is intended to prevent the use of new methods or devices, provided, however, that sufficient data (technical and other) are submitted to the enforcement authority to demonstrate that the new method or device is equivalent (in quality, effectiveness, durability, and safety) to that prescribed by 527 CMR 24.00.

(3) 527 CMR 24.00 shall not apply to those installations for which the head of the local fire department has given installation approval prior to the effective date of 527 CMR 24.00.

(4) The design, installation, and performance of required fire warning systems, pursuant to M.G.L. c. 148, § 26C, shall be in accordance with NFPA 72.

(5) When any provision of 527 CMR 24.00 is in conflict with any provision of NFPA 72 on the effective date of 527 CMR 24.00 or hereafter adopted, the provision which establishes the higher standard for the promotion and protection of the safety and welfare of the public shall prevail. The head of the fire department shall enforce 527 CMR 24.00.

24.03: Definitions

The following terms shall have the following meanings for the purpose of 527 CMR 24.00 and M.G.L. c. 22, § 14; and M.G.L. c. 148, §§ 10 and 28.

Apartment Houses. Buildings containing six or more dwelling units with independent cooking and bathroom facilities, whether designated as apartment house, tenement, garden apartment, condominium, or by any other name.

Approved. This term means equipment or materials listed or labeled or included on a list published by an organization acceptable to the Board of Fire Prevention Regulations or the State Fire Marshal, which organization is concerned with product evaluation, maintains periodic inspection or production of listed equipment or materials, and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

24.03: continued

Automatic Heat Detector. A device which automatically detects abnormally high temperature or rate of temperature rise and automatically initiates an audible alarm that can be effectively heard above the maximum noise level obtained under normal conditions of occupancy.

Automatic Smoke Detector. A device which automatically detects the visible or invisible particles of combustion and automatically initiates an audible alarm that can be effectively heard above the maximum noise level obtained under normal conditions of occupancy.

Boarding or Lodging Houses. Buildings in which separate sleeping rooms are rented providing sleeping accommodations for persons on either a transient or a permanent basis, with or without meals, but which may have separate cooking facilities for individual occupants.

Dormitories. Buildings or spaces in buildings where group sleeping accommodations are provided for persons not members of the same family group in one room or in a series of closely associated rooms under joint occupancy and single management, as in college dormitories, fraternity houses, military barracks, and ski lodges, with or without meals, but without individual cooking facilities.

Dwelling Unit. A single living unit consisting of one or more rooms and providing complete independent living facilities for one or more persons including permanent provisions for living, sleeping, cooking, and sanitation.

Hotels and Family Hotels. Buildings or groups of buildings under the same management in which there are sleeping accommodations for hire, primarily used by transients who are lodged with or without meals, whether designated as a hotel, inn, club, motel, or by any other name. So-called apartment hotels shall be classified as hotels because they are potentially subject to transient occupancy similar to that of hotels.

24.04: Approval of Design

(1) Complete information in accordance with the requirements in 527 CMR 24.05, 24.06, and 24.07 regarding the fire protection devices, equipment, and systems shall be submitted to the head of the fire department for approval prior to beginning any installation of the detectors.

(2) The information submitted shall include specifications and floor plans showing the location of all devices and controls.

24.05: Power Supply Sources

(1) General.

(a) All power supplies shall be sufficient to operate the alarm signal(s) for at least four continuous minutes.

(b) For electrically powered devices, an AC primary power source shall be utilized. However, in existing buildings where the head of the fire department finds that circumstances prohibit the use of wiring, the head of the fire department may permit a monitorized battery as the primary source of power inside a dwelling unit. The circumstances that may be considered include, but are not limited to, the structural design of the building, the economic cost to the owner, the likelihood of fire at the locus, and the type of material used in the structure of the building.

(2) Primary Power Supply (AC).

(a) An AC primary source of electric power shall be a dependable commercial light and power supply source. A visible "power on" indicator shall be provided.

(b) All detector systems designed for operation on a voltage in excess of 30 volts shall be installed in accordance with the latest Massachusetts Electrical Code, 527 CMR 12.00. (c) Cord-connected installations shall not be allowed.

(d) Fire warning equipment shall not be subject to loss of power by a wall switch.

(e) Neither loss nor restoration of primary power shall cause an alarm signal.

24.05: continued

(3) Primary Power Supply (Monitored Battery). Where allowed and approved by the head of the fire department, fire warning equipment may be powered by a battery provided that the battery is monitored to assure that the following conditions are met:

(a) All power requirements are met for at least one year's life, including weekly testing.

(b) A distinctive audible trouble signal is given before the battery is incapable of operating (from aging, terminal corrosion, etc.) the device for alarm purposes.

NON-TEXT PAGE

24.05: continued

(c) For a unit employing a lock in alarm feature, automatic transfer is provided from alarm to a trouble condition.
(d) The unit is capable of producing an alarm signal for at least four minutes at the battery voltage at which a trouble signal is normally obtained followed by seven days of trouble signal operation.
(e) The audible trouble signal is produced at least once every minute for seven consecutive days.
(f) The monitored batteries meeting these specifications are clearly identified on the unit near the battery compartment.

24.06: Equipment Performance

(1) Smoke Detectors.
(a) Each smoke detector shall detect abnormal quantities of smoke that may occur in a building and shall properly operate in the normal environmental conditions of said building.
(b) All smoke detectors used pursuant to the provisions of 527 CMR 24.00 shall be listed to UL 268.

(2) Heat Detectors
(a) Each heat detector shall detect abnormally high temperature or rate-of-temperature rise, and all detectors shall be listed or approved for not less than 50 ft. (15 m) spacing.

(b) Fixed temperature detectors shall have a temperature rating at least 25°F (14°C) above the normal ambient and shall not exceed 50°F (28°C) higher than the maximum anticipated ambient temperature in the room or space where installed.

(3) Alarm Audibility and Responsibility. All alarm sounding devices shall have a minimum rating of 85 dBa (adjusted decibels) at ten feet (3m).

(4) Control Equipment.
(a) The control equipment shall be automatically restored on restoration of electrical power.
(b) The control equipment shall be of a type that "locks in" on an alarm condition. Smoke detection circuits need not lock in.
(c) If a reset switch is provided, it shall be a self-restoring type.
(d) Any alarm silencing switch or an audible trouble silencing switch shall not be provided unless its silenced position is indicated by a readily apparent signal.
(e) Each electrical fire warning system and single station smoke detector shall have an integral test means to permit the owner to check the system and sensitivity.

(5) Detector Circuits.
(a) A detector circuit will be required where a break in the wiring will not cause an alarm signal, but will cause an audible trouble signal, using either a closed loop detector circuit or normally open contact detectors with end-of-line resistor or equivalent. Exception: A single open or a single ground fault in any wiring among multiple station interconnected detectors or any wiring extending to a remote signaling device is not required to be indicated by a trouble signal if the fault does not prevent operation of any of the interconnected units as a single station detector.

(6) Combination System.
(a) When common wiring is employed for a combination system, the equipment for other than the fire warning signaling system shall be connected to the common wiring of the system so that short circuits, open circuits, grounds, or any fault in this equipment or interconnection between this equipment and the fire warning system wiring shall not interfere with either the supervision of the fire warning system or prevent alarm or trouble signal operation.
(b) In a fire/burglar system, the operation shall be as follows:
1. A fire alarm shall take precedence or be clearly recognizable over any other signal even when the nonfire alarm signal is initiated first.

24.06: continued

2. Distinctive alarm signals shall be obtained between fire alarm and other functions, such as burglar alarm. The use of a common sounding appliance for fire and burglar alarm is acceptable if distinctive signals are obtained. A steady, continuous sound for one alarm function is acceptable.

24.07: Installation

(1) General.

(a) All equipment shall be installed in a workmanlike manner.

(b) All devices shall be so located and mounted that accidental operation will not be caused by jarring or vibration.

(c) Installed fire warning equipment shall be mounted so as to be supported independently of its attachment to wires.

(d) All installation wiring shall be in accordance with the requirements of the manufacturer of the equipment connected to the said wiring.

(2) Detector Location and Spacing.

(a) Smoke Detectors.

1. All automatic smoke and heat detectors located in lobbies, common corridors, hallways and stairways of buildings subject to 527 CMR 24.00 shall be interconnected thereby producing a simultaneous series of audible alarms throughout the entire building.

2. All lobbies, common corridors, hallways and exitway access discharge routes shall be provided with automatic smoke detectors with no more than a 30' spacing between detectors.

3. In buildings having more than one level serviced by open stairways, a detector shall be located on the ceiling on the uppermost level of the stairwell, and a detector shall be located on the ceiling of the lowest level.

4. A smoke detector installed in a stairwell shall be so located as to assure that smoke rising in the stairwell cannot be prevented from reaching the detector by an intervening door or obstruction.

5. A smoke detector installed to detect a fire in the basement shall be located in close proximity to the stairwell leading to the floor above.

6. One approved smoke detector shall be installed to protect each separate sleeping area. Bedrooms (or sleeping rooms) separated by other use areas such as kitchens or living rooms (but not bathrooms) shall, for the purposes of 527 CMR 24.00, be considered as separate sleeping areas.

7. A smoke detector installed to protect a sleeping area shall be located outside the bedrooms but in the immediate vicinity of sleeping area.

8. The smoke detector installed on a story without a separate sleeping area shall be located in close proximity to the stairway leading to the floor above.

9. The head of the fire department may require that an automatic single station detector be installed within the sleeping area of dormitory bedrooms.

10. Smoke detectors shall be located on or near the ceiling.

11. Smoke detectors in rooms with ceiling slopes greater than one foot rise per eight feet horizontally shall be located at the high side of the room.

12. A smoke detector shall not be required to be located in or within six feet of a kitchen, cooking area, or garage. 527 CMR 24.07 does not, however, preclude installation in these areas.

13. In circumstances where smoke detectors cannot operate (i.e. open rear porches and stairways), the head of the fire department may require the installation and interconnection of heat detectors with the system type in use.

(b) Heat Detectors.

1. On smooth ceilings, heat detectors shall be installed within the strict limitations of their listed spacing.

2. For sloped ceilings having a rise greater than one ft. in eight ft. (one m in eight m) horizontally, the detector shall be located on or near the ceiling at or within three ft (0.9 m) of the peak. The spacing of additional detectors, if any, shall be based on a horizontal distance measurement, not on a measurement along the slope of the ceiling.

24.07: continued

3. Heat detectors shall be installed on or near the ceilings.

(3) Fire Warning Systems.

(a) Type I system shall consist of the following: A series of approved smoke detectors and heat detectors with an approved secondary source of power and annunciator at grade level, located pursuant to the approved design specifications. The system shall provide for automatic fire department notification approved by the head of the fire department.

(b) Type II system shall consist of the following: A series of approved smoke and heat detectors with an approved secondary source of power and annunciator at grade level, located pursuant to the approved design specifications.

(c) All buildings which contain 13 or more separate dwelling units shall be provided with a Type I system. The head of the fire department may waive the requirement of automatic fire department notification in circumstances considered in accordance with 527 CMR 24.05(1)(b).

(d) All buildings which contain six to 12 separate dwelling units shall be provided with a Type II system. If the said building contains three or more levels, manual pull stations shall be provided. The manual pull stations shall be located on the corridor side of and within six feet of each entrance to an exitway. Manual pull stations shall be connected to the building fire alarm system in conformance with NFPA 72. The head of the fire department may waive the requirement of manual pull stations and/or an annunciator in circumstances considered in accordance with 527 CMR 24.05(1)(b).

24.08: Maintenance and Testing

(1) General.

(a) Each automatic detector shall be continuously maintained in reliable operating condition at all times, and such periodic inspections and tests shall be made as are necessary to assure proper maintenance as specified.

(b) Detectors shall be under the supervision of a responsible person who shall cause proper tests to be made at specific intervals and have general charge of all alterations and additions.

(c) In any tests, all persons who would automatically receive an alarm shall be notified so that an unnecessary response shall not take place.

(d) After installation, a visual inspection of all detectors shall be made to insure that they are properly located.

(e) After installation, each detector shall be checked to insure that it is properly connected and powered in accordance with the manufacturer's recommendations.

(2) Initial Installation Tests.

(a) Heat Detectors.

1. A self-restorable spot-type detector shall be tested with a heat source, such as a hair drier or shielded heat lamp, until it responds. After each heat test, the detector shall reset itself.

2. Line or spot-type detectors of the nonrestorable type shall not be heat tested.

3. Detectors with a replaceable fusible alloy element shall be tested by:

a. removing the fusible element to determine that the detector contacts operate properly, and then

b. reinstalling the fusible element.

(b) Smoke Detectors.

1. To assure that each smoke detector is operative, it shall be tested, in place, in accordance with the manufacturer's instructions.

2. Instruments for checking the sensitivity of some detectors are available from the manufacturer. When using these, the manufacturer's recommended test instructions shall be followed.

(3) Periodic Tests.

(a) Detectors shall be tested as described in the following paragraphs. The method of test shall be as outlined in 527 CMR 24.08(2).

24.08: continued

(b) For nonrestorable spot-type detectors, after the 15th year, at least two detectors out of every hundred, or fraction thereof, shall be removed every five years and sent to a nationally recognized testing laboratory for tests. The detectors removed for this purpose shall be replaced with new detectors. If a failure occurs on any of the detectors removed, additional detectors shall be removed and tested as a further check on the installation until there is proven to exist either a general problem involving faulty detectors, or a localized problem involving only one or two defective detectors.
(c) For restorable spot-type heat detectors, at least one detector on each signal initiating circuit shall be tested semi-annually and different detectors shall be selected for each test.
(d) Line-type fixed-temperature detectors shall have their loop resistance measured and recorded in the control cabinet at least semi-annually.
(e) Smoke detectors shall be tested annually in accordance with the manufacturer's instructions.
(f) A permanent record showing all details of the test including the name of the inspector, type, number, location and the results of detectors tested on a specific date shall be kept by the building owner, and a copy shall be submitted to the head of the fire department.

(4) Cleaning and Maintenance. Ionization and photoelectric smoke detectors may require periodic cleaning to remove dust or dirt which has accumulated. The frequency of cleaning will depend on the local ambient conditions. For each detector, the cleaning, checking, operation, and sensitivity adjustment shall be attempted only after consulting the manufacturer's instructions.

(5) Tests Following an Alarm. Detectors shall be restored to service as promptly as possible after each test or alarm, and shall be kept in normal condition for operation. Devices requiring resetting or replacement shall be reset or replaced as promptly as possible after each test or alarm.

24.09: Acceptance

(1) Acceptance Test.
(a) Upon completion of the system, the installer, in the presence of the owner, shall test each self-restoring device for proper operation. He shall then instruct the owner on the operation and maintenance of the system.
(b) Upon completion of the installation, a satisfactory test of the fire detectors shall be made in the presence of the head of the fire department or his designee.
(c) All apparatus shall be restored to normal as promptly as possible after each alarm or test.

(2) General.
(a) Before requesting final approval of the installation by the head of the fire department, the installing contractor shall furnish a written statement to the effect that the detectors have been installed in accordance with the manufacturer's specifications.
(b) The installation of such devices shall be completed within six months of approval of plans or notification by the head of the fire department that such installation is required under M.G.L. c. 22, § 14; and M.G.L. c. 148, § 28.

REGULATORY AUTHORITY

527 CMR 24.00: M.G.L. c. 22, § 14; 148, §§ 10 and 28.

527 CMR 25.00: OBSTRUCTIONS AND HAZARDS IN CERTAIN BUILDINGS AND ON PUBLIC OR PRIVATE WAYS

Section

25.01: Definitions
25.02: Public and Private Ways
25.03: Exterior Access to Buildings Designed for Retail Occupancy
25.04: Interior of Buildings Used for Retail Purposes
25.05: Commercial and Institutional Occupancy Buildings
25.06: Buildings of Industrial Occupancy
25.07: Buildings of Habitable Occupancy
25.08: Public and Private Property
25.09: Removal of Obstructions and/or Hazardous Materials

25.01: Definitions

For the purpose of 527 CMR 25.00, the following terms shall have the meanings respectively assigned to them:

Approved. Approved by the State Fire Marshal.

Building. Any structure used in accordance with the occupancies noted in 527 CMR 25.00, such structure not to include one, two, or three-family dwellings.

Occupancies.
(a) Retail. Any building to which the public may have ready access at certain times for the purpose of purchasing goods or services but not including buildings having professional occupancies such as doctors, dentists, lawyers, architects, engineers, etc.
(b) Commercial and Institutional. Any building used primarily for the conducting of one or more business enterprises to which the public has access but which are not primarily devoted to the sale of actual goods that may be carried away by the public. Such buildings may include schools, colleges, laboratories, restaurants, business offices, banks, warehouses, etc. Retail occupancy in one or more of the first three floors of a multi-story commercial building will be allowed without altering the commercial designation of said building.
(c) Industrial. Any building used for the manufacture of products.
(d) Habitable. Any building, institution, or residence designed to house more than three families where people regularly sleep. This includes dormitories, condominiums, hospitals, hotels, rooming houses, nursing homes, etc. Sections of a multiple residence structure that are separated by at least the equivalent of a six-inch thick concrete block wall shall be considered single buildings in accordance with 527 CMR 25.00.

Hazardous Substance. Any liquid, solid, or gas which is toxic, flammable, explosive, or reactive when combined with other substances within the immediate vicinity of the substance, or any substance which could increase the intensity or the spread of fire out of proportion to the normal materials present in the area.

Obstruction. Any fixed object, such as but not limited to a fence, post, pole, wall, ditch, or any movable object such as but not limited to a gate, barrel, tank, motor vehicle or truck whether registered or unregistered, temporary structure of metal or wood, or other physical barrier which might prevent the access of firefighters or firefighting equipment.

25.02: Public and Private Ways

If the head of the fire department determines that an obstruction exists or that there is a quantity of hazardous material stored on a public or private way or access area contiguous to any of the buildings referred to in 527 CMR 25.00 which might prevent the access of fire apparatus or firefighting personnel to the contiguous building, he shall have the authority to have such obstruction or hazardous material removed by the owner.

25.03: Exterior Access to Buildings Designed for Retail Occupancy

The plan for any new retail building shall include an access for fire equipment on at least two sides of the building, such access to be approved by the head of the fire department on the plans prior to construction of the building. Access to present buildings shall be kept clear of hazardous substances and obstacles which may, in the opinion of the fire department, impede the proper placement of fire apparatus and personnel in case of fire.

25.04: Interior of Buildings Used for Retail Purposes

The head of the fire department will inspect retail establishments and may direct the owner or operator of such building relative to maintaining clear aisles and exits free of obstructions and hazardous substances. The head of the fire department may also direct the operator of the establishment to locate hazardous substances in certain areas of the building so that there will be less danger to the public in case of fire.

25.05: Commercial and Institutional Occupancy Buildings.

The head of the fire department shall inspect the outside access to such buildings to make certain that suitable areas are provided for the stationing of fire apparatus for rescue and fire extinguishment purposes and that sufficient unimpeded entrances and exits exist for the entrance of firefighting personnel and the evacuation of the building. The interior of the building shall be inspected by the head of the fire department to ascertain that all exits and main corridors are free of obstruction and that hazardous materials, if kept in such buildings, shall be located in a place designated by the head of the fire department. If the head of the fire department believes that obstructions or hazardous substances present an impediment to the evacuation of the building or the access of the fire department, he may have such obstacles or hazardous substances removed.

25.06: Buildings of Industrial Occupancy

Access for fire apparatus shall be provided on at least one side of every industrial type building, such access to be kept clear of all obstacles and hazardous materials as the head of the fire department may direct. The interior corridors and exitways of all such buildings shall also be kept clear of obstacles and hazardous materials as directed by the head of the fire department, who shall inspect all such buildings at least once each year at any time without prior notice provided it is during the normal working hours of such institution.

25.07: Buildings of Habitable Occupancy

Each building built for residential occupancy after the approval of 527 CMR 25.00 shall include a suitable paved access for fire apparatus on at least one side of the structure. In addition, a clear, unobstructed way shall be provided from such fire apparatus access point to all exits of such building. The head of the fire department shall inspect such access areas and order any obstacles or hazardous materials removed at his discretion. The head of the fire department shall also inspect the interior of such buildings at a reasonable hour and shall make certain that corridors, hallways, and other exitways are clear of obstacles and hazardous materials which might prevent the timely evacuation of the building or the efficient operation of the firefighting personnel in case of fire or explosion.

25.08: Public and Private Property

Hazardous substances shall not be left unattended within 100' of any building without a permit from the head of the fire department. If, in his opinion, the nature of the hazard requires a greater separation from the building, the head of the fire department may so dictate. The head of the fire department may order hazardous materials to be removed from any public or private property if the presence of such material does not comply with 527 CMR 25.00 or with other regulations of 527 CMR.

25.09: Removal of Obstructions and/or Hazardous Materials

If the head of the fire department determines that an obstruction exists or that there is a quantity of hazardous material stored that must be removed in accordance with 527 CMR 25.00, he shall have the authority to require such obstruction or hazardous material removed by the owner. If after an inquiry to persons within the building involved or within the contiguous building and after making obvious inquiries concerning the owner of such obstruction, such owner is unavailable, the head of the fire department may have the obstruction removed by others at his discretion. The cost of such removal will be borne by the owner if and when located.

REGULATORY AUTHORITY

527 CMR 25.00: M.G.L. c. 22, § 14; c. 148, § 28.

NON-TEXT PAGE

527 CMR 26.00: COMPRESSED NATURAL GAS CONTAINERS AND SYSTEMS

Section
26.01: Purpose
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26.05: Installation of Equipment - Compliance Requirements
26.06: Emergency Reporting Procedure and Equipment
26.07: Installation Standards and Procedures
26.08: Permits and Licenses
26.09: Referenced Publications

26.01: Purpose

The purpose of 527 CMR 26.00 is to provide minimum standards for CNG systems for the protection and safety of the public at large.

26.02: Scope

(1) Effective as of November 1, 1995, 527 CMR 26.00 shall, except as provided in 527 CMR 26.02(3), apply to the design, construction, location, installation, and operation of CNG systems.

(2) 527 CMR 26.00 shall not apply to the following:
(a) The transportation of compressed natural gases over the highways in interstate or intrastate commerce.
(b) OEM CNG powered Vehicles complying with Federal Motor Vehicle Safety Standards.
(c) CNG powered Vehicles certified that they are in compliance with NFPA 52.

(3) Existing systems installed before November 1, 1995, may be continued in service provided that their continued operation does not constitute a threat to health or safety.

26.03: Definitions

The following terms shall have the meanings assigned to them unless the context clearly indicates otherwise.

Abandoned. Any container without use, either filling or draw off of CNG, for a continuous period in excess of 12 months.

Approved. Approved by the State Fire Marshal.

ASME. The American Society of Mechanical Engineers.

Bulk Storage. Storage in pressure vessels other than cylinders.

Capacity. The water volume of a container in standard cubic feet per gallons.

Cascade Storage System. Storage in multiple pressure vessels, cylinders, or containers.

Compressed Natural Gas (CNG). Mixtures of hydrocarbon gases and vapors, consisting principally of methane in gaseous form, that has been compressed.

Container. Any pressure vessel or cylinder used for storing CNG.

Cylinder. A container constructed, inspected, and maintained according to DOT or TC regulations, ANSI/AGA NGV2, or CSA B51 standards.

26.03: continued

Dispensing Station. A natural gas installation that dispenses CNG from storage containers or natural gas pipeline by means of a compressor into fuel supply containers or into portable containers.

Equipment. The container or containers, major devices such as vaporizers, relief valves, excess flow valves, regulators, etc., and interconnecting piping.

Equivalent Gallon. The amount of CNG that provides the Gasoline Gallon Equivalent, or the "equivalent energy" of a gallon of gasoline. The conversion factor is 1 GGE = 5.660 pounds of natural gas. (1 GGE of Natural Gas = 123.55 cubic feet)

Fuel Supply Container. A container mounted on a vehicle to store CNG as the fuel supply to the internal combustion engine of the vehicle.

Installation. A system that includes natural gas containers, pressure booster, compressors, and all attached valves, piping, and appurtenances. When the supply is form distribution pipelines, the installation includes all equipment after the shutoff valve between the pipeline and the compressor.

Identification Decal, Vehicle. A label or decal placed on a vehicle fueled by CNG identifying such vehicle for the fire service [*See* 527 CMR 26.07(7)(j)].

License. A license required by 527 CMR 26.00 and issued by the local licensing authority after a hearing in accordance with the provisions of M.G.L. c. 148, § 13.

Marshal. The State Fire Marshal.

Nationally Recognized Testing Laboratory (NRTL). An organization which tests for safety and lists, labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00 (Appendix C).

Person. Any individual, firm, association, or corporation.

Permit. A permit required by 527 CMR 26.00 and issued by the head of the fire department under authority of M.G.L. c. 148, § 10A.

Pressure Vessel. A container or other component designed in accordance with the ASME Code or DOT (Department of Transportation) regulations.

Qualified Person. A person selected by an employer and trained to perform a specific task or duty involving CNG, who has the degree of competency necessary to accomplish the work in a safe manner or the competent licensed motor vehicle operator of a CNG fueled vehicle.

Shall. A mandatory requirement.

USDOT. The U.S. Department of Transportation.

Vehicle Fueling Appliance: A fuel dispensing device, including all of its component parts, used for the delivery of CNG, that has a flow rate not in excess of 10 SCF/min. (0.28 standard cubic meter/min.). All VFA's shall be listed by an approved testing laboratory.

Vendor. Any individual, firm, or corporation who sells, installs, or dispenses CNG and/or related equipment.

Warning Label, Cylinder. A label or decal placed on a cylinder informing the user of certain precautions to take.

26.04: Approval of Equipment

(1) All CNG installations shall be approved by the State Fire Marshal, CNG vehicle fueling facilities shall be permitted, provided that the applicant for such a system has submitted complete plans and specifications of the proposed installation to the Marshal accompanied by the required examination fee as authorized in M.G.L. c. 7, § 3B and has obtained approval of such plans, and further provided that there is compliance with 527 CMR 26.00.

(2) The approval of any equipment, container, or appliance shall be based on compliance with accepted principles or recognized engineering practice; and the Marshal may consider as approved any equipment, container, or appliance which meets the requirements of a nationally recognized testing laboratory (NRTL). Such equipment, container, or appliance shall bear some mark of identification to indicate the standard to which it conforms.

(3) All parts of CNG systems not specifically provided for in 527 CMR 26.00 shall be designed and constructed to provide a reasonable degree of safety.

26.05: Installation of Equipment - Compliance Requirements

(1) All CNG systems shall be installed and maintained in accordance with the requirements of 527 CMR 26.00 except as provided in 527 CMR 26.02(3).

(2) No CNG equipment shall be connected to any appliance that is not designed, constructed, or adapted for CNG use.

(3) The owner and/or operator of the CNG installation shall be responsible for the installation of the CNG facility and for maintaining it in a safe operating condition.

(4) Only a qualified person shall install, remove, connect, disconnect, sell, fill, refill, deliver or permit to be delivered, or operate any CNG system.

(5) The Marshal may order the user of a system to meet additional requirements:
- (a) Where unusual conditions exist;
- (b) When it necessary for the protection of life and property;
- (c) Provided the additional requirements are within the intent and purpose of 527 CMR 26.00.

26.06: Emergency Reporting Procedure and Equipment

(1) All CNG installations exceeding 3,000 cubic feet shall be provided with a marker plate or sign indicating who should be called in the event of an emergency involving the CNG installation. The marker or sign shall include the name and telephone number of the Natural Gas supplier, facility maintenance person, owner, or operator who will respond to the emergency.

(2) The Natural Gas supplier, facility maintenance, owner or operator shall respond when notified of all CNG emergencies occurring at his installation and shall maintain a 24-hour phone service.

26.07: Installation Standards and Procedures

(1) NFPA 52, Standards Adopted by Reference.
- (a) The storage and handling of Compressed Natural Gas (CNG) shall be in accordance with NFPA 52, except as otherwise indicated in 527 CMR 26.02(2).
- (b) Where any conflict occurs between NFPA 52 and 527 CMR 26.00, 527 CMR 26.00 shall prevail.

26.07: continued

(2) Container Markings. All CNG containers shall be legibly marked with labels meeting industry recognized standards by the tank manufacturers.

(3) Container Storage Outside of Buildings.

(a) Containers shall be installed outside of buildings in accordance with NFPA 52 , and 527 CMR 26.00, where there is a conflict between NFPA 52 and 527 CMR 26.00, 527 CMR 26.00 shall prevail.

(b) Where there is a possibility of damage to storage systems from motor vehicles or other heavy objects, protection against such damage shall be provided.

(c) Units installed directly under or near a window opening or gas accumulating overhang shall be provided with a vent line reaching over the roof line, interiors shall also be provided with methane detection devices capable of shutting down the appliance. Exception: if the VFA and all its component parts are located more than ten feet from the building it shall be exempted from 527 CMR 26.07(3)(c).

(4) Underground Installation of Storage Containers. No underground storage shall be allowed.

(5) Container Storage Inside Buildings.

(a) Containers shall be considered as full containers for the purpose of determining the maximum quantities of CNG permitted.

(b) Containers shall not be stored inside buildings used for habitation.

(c) The maximum quantity of CNG stored in a building or room of special construction shall be 10,000 cubic feet. The building or room shall comply with NFPA 52.

(d) A portable fire extinguisher having a rating of not less than 40-B:C shall be provided in the storage and dispensing area.

(e) Container storage areas shall be posted in compliance with 527 CMR 26.07(3)(d).

(6) Distributing Points, Distributing Plants, and Industrial Plants.

(a) 527 CMR 26.07(6) shall apply to:

1. Distributing points of any capacity;
2. Distributing plants of any capacity; or
3. Industrial plants of 3,000 cubic feet aggregate water capacity or more.

(b) If loading or unloading is normally done during other than daylight hours, adequate lights shall be provided to illuminate storage containers, control valves, and other CNG equipment.

(c) Suitable roadways or means of access for extinguishing equipment, such as wheeled extinguishers or fire department apparatus, shall be provided.

(d) The CNG system shall be enclosed within an industrial type fence at least six feet high with at least two egress gates opening outward and remotely located from each other, or be within an approved fence plant area, or protected from tampering, VFA operations shall be provided with a fenced area for vehicle containment while fueling, secured while unattended.

(e) The CNG system shall be protected against vehicle damage, with four inch diameter bollards, metal guardrail, or other similar barriers approved by the Marshal.

(f) The storage, loading, unloading, cylinder and vehicle filling areas, and other strategic points shall be adequately posted in accordance with 527 CMR 26.07.

(g) Only a qualified person shall dispense CNG into any CNG container.

(h) Before a container mounted on a vehicle is filled, the vehicle engine shall be shut off and all sources of ignition, such as pilot lights, smoking materials, etc., within the immediate area shall be extinguished.

(i) "NO SMOKING" and "STOP ENGINE WHEN REFUELING" signs shall be displayed at the filling station. The signs shall have block letters at least two inches high with either red letters on a white background or white letters on a red background.

(j) Every motor vehicle powered by CNG shall bear a reflective decal. The decal shall be placed on an exterior vertical or near-vertical surface on the lower right rear of the vehicle but not on the bumper inboard from any other markings. The diamond shape label shall be a minimum 4.75 inches (120 mm) long by 3.25 inches (83 mm) high. The marking shall consist of a border and letters "CNG" [one inch (25 mm) minimum height centered in the diamond] of silver or white reflective luminous material on a blue background.

26.08: Permits and Licenses

(1) Installation and Inspection.

(a) No person shall install or connect any CNG equipment unless a permit to install CNG has been obtained from the head of the fire department. No permit shall be required, however, to make a connection in the fueling of CNG powered vehicles, replacement of a portable container, or the filling of a stationary container.

(b) Application for a permit to install CNG shall be made in the name of the owner or occupant of the premises by the person, firm, or corporation who will make the installation or connection. If the aggregate amount of CNG to be stored exceeds 10,000 cubic feet, then a license as required by 527 CMR 26.08(2)(b) must first be obtained and a copy of the license shall be submitted with the application for a permit to install CNG.

(c) The head of the fire department may limit the quantity of CNG that may be stored under a permit or order the installer of a system to meet additional requirements:

1. Where unusual conditions exist;
2. When it necessary for the protection of life and property;
3. Provided the additional requirements are within the intent and purpose of 527 CMR 26.00.

(d) Upon completion of an installation or connection authorized by a permit to install CNG, the person, firm or corporation having made the installation or connection shall certify in writing on a form approved by the Marshal to the head of the fire department that the work has been completed and in conformity with the requirements of 527 CMR 26.00.

(e) Upon receipt of such certification of completion, the head of the fire department shall make an inspection of the installation within a reasonable time; and if same is found to be in accordance with 527 CMR 26.00, he shall issue to the owner or occupant a permit for the keeping, storage, manufacture or sale CNG in connection therewith, except where such storage is otherwise authorized by license; provided, however, that if such installation is found not to be in accordance with these regulations, the permit shall be withheld and shall not be issued until the proper corrections have been made as directed, by written notice if requested, within a reasonably specified time and prior to any CNG being stored in the container(s).

(2) Storage License or Registration.

(a) No person shall keep or use any CNG or install or connect any CNG equipment to any appliance except in accordance with the requirements of 527 CMR 26.00.

(b) In accordance with the provisions of M.G.L. c. 148, § 13, 10,000 cubic feet of CNG, in the aggregate, is hereby prescribed as the maximum amount that may be kept, stored, manufactured or sold, in one or more containers without a license or registration, or either of them, provided that a permit for the keeping, storage, manufacture or sale of CNG has been obtained, except as hereinafter provided for.

(c) When more than 10,000 cubic feet of CNG will be stored, manufactured or sold, a license shall first be obtained from the local licensing authority by the owner or occupant of the premises in accordance with the provisions of M.G.L. c. 148, § 13.

(d) The permit for the keeping, storage, manufacture or sale of CNG must be obtained from the head of the fire department as provided by M.G.L. c. 148, §§ 10A and 23.

(e) The permit for the keeping, storage, manufacture or sale of CNG may be revoked by the head of the fire department as provided by M.G.L. c. 148, §§ 10A and 23, if the installation is changed or modified in any way or of the provisions of 527 CMR 26.00 are not complied with.

26.09: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 26.00 shall be considered a part of the requirements of 527 CMR 26.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 26.00: M.G.L. c. 22, § 14; c. 148, §§ 9, 10 and 28.

NON-TEXT PAGE

527 CMR 27.00: EMERGENCY AND STANDBY POWER SYSTEMS

Section

27.01: Purpose and Scope
27.02: Adoption by Reference
27.03: Modifications of Provisions of NFPA 110

27.01: Purpose and Scope

The purpose of 527 CMR 27.00 is to provide performance requirements for the installation, maintenance, operation, and testing of emergency power supply systems.

27.02: Adoption by Reference

For the purposes of 527 CMR 27.00, the provisions of NFPA standard No. 110, Emergency and Standby Power Systems, 2002 Edition, are incorporated by reference except for the modifications stated in 527 CMR 27.03

27.03: Modification of Provisions of NFPA 110

For the purpose of 527 CMR 27.00, the provisions of NFPA 110 shall be modified as follows:

Chapter 3 Definitions:

3.2.2 Authority Having Jurisdiction: The head of the fire Department.

3.2.6 Should: For the purposes of 527 CMR 27.00, it is to indicate "shall".

REGULATORY AUTHORITY

527 CMR 27.00: MGL c. 148, §§ 10 and 28.

NON-TEXT PAGE

527 CMR 28.00: COMBUSTIBLE FIBERS

Section

28.01: Scope
28.02: Definitions
28.03: Storage

28.01: Scope

527 CMR 28.00 applies to the storage of combustible fibers.

28.02: Definitions

For the purpose of 527 CMR 28.00, the following terms shall have the meanings respectively assigned to them:

Baled Combustible Fibers: Fibers which have been suitably wrapped and bound or otherwise packaged.

Combustible Fiber: Any readily ignitable and free-burning fiber including but not limited to materials such as cotton, sisal, henequen, ixtle, jute, hemp, tow, cocoa fiber, oakum, baled waste, baled waste paper, kapok, hay, straw, Spanish moss, excelsior, certain synthetic fibers and cloth in the form of scraps and clippings.

Loose Combustible Fibers: Fibers which are not in suitable bales or packages.

28.03: Storage

(1) In accordance with the provisions of M.G.L. c. 148, § 13, the Board hereby prescribes that a permit for the storage and handling of combustible fibers in quantities in excess of 100 cubic feet shall be obtained from the head of the fire department as provided by M.G.L. c. 148, § 10A. No permit shall be required for agricultural storage.

(2) Loose combustible fibers, whether housed or in the open, shall not be stored in or within 100 feet of any building, except as provided for below:
(a) Not more than 100 cubic feet of loose combustible fibers kept in any building shall be stored in a metal or metal-lined bin equipped with a self-closing cover.
(b) Quantities exceeding 100 cubic feet of loose combustible fibers, but not exceeding 500 cubic feet, shall be stored in rooms or compartments having floors, walls and ceilings witha fire resistance rating of not less than one hour. Each opening into such rooms or compartments from other parts of the building shall be equipped with an approved opening protective. Such fire resistance rated assemblies shall comply with the applicable requirements of the State Building Code.
(c) Quantities exceeding 500 cubic feet of loose combustible fibers shall be stored in rooms constructed in accordance with the requirements of the State Building Code.
(d) A maximum of 2,500 feet of loose fibers shall be stored in a detached "loose house" suitable located with openings properly against entrance of sparks. The "loose house" shall not be used for any other purpose.

(3) The storage of baled combustible fibers shall comply with the following requirments:
(a) A single block or pile shall not contain more than 7,200 cubic feet of fiber exclusive of aisles or clearances.
(b) Blocks or piles shall be separated from adjacent storage by aisles not less than five feet wide, or by flash fire barriers consisting of continuous sheet of noncombustible material extending from floor to a height of at least one foot above the highest point of piles and projecting at least one foot beyond the sides of the piles.

28.03: continued

(c) Sisal and other fibers in bales bound with combustible tie ropes, and also jute and other fibers liable to swell when wet, shall be stored to allow for expansion in any dirction without endangering building walls, ceilings or columns. Not less than three feet clearance shall be left between walls and sides of piles, except that if the storage compartment is not more than 30 feet in width, one foot clearance will be sufficiant, providing a center aisle not less than five feet wide is maintained.
(d) A minimum clearance of three feet shall be maintained between the sprinklers and tops of piles.

(4) The storage of hay, straw or other similar agricultural products shall comply with the following requirments:
(a) No person shall store hay, straw or similar agricultural products adjacent to buildings or combustible material unless a cleared horizontal distance equal to the height of a pile is maintained between such storage and combustible material and buildings.
(b) Storage shall be limited to stacks of 100 tons each.
(c) Quantities of haw, straw and other agricultural products shall not be limited where stored in or near farm buildings located outside closely-built areas.

(5) Ashes, waste, rubbish or sweepongs shall not be kept in wooden or other combustible receptacles in combustible fiber storage areas and shall be removed from the premises daily. Grass and weeds shall not be allowed to accumulate at any point on the premises.

REGULATORY AUTHORITY

527 CMR 28.00: M.G.L. c. 148, §10.

527 CMR 29.00: UPHOLSTERED FURNITURE, MOLDED SEATING AND RE-UPHOLSTERED FURNITURE

Section

29.01: Definitions
29.02: General Requirements
29.03: Requirements for Upholstered Furniture and Molded Seating
29.04: Requirements for Re-Upholstered Furniture
29.05: Table 1
29.06: Referenced Publications

29.01: Definitions

For the purpose of 527 CMR 29.00, the following words shall have the meanings respectively assigned to them:

Approved. Unless otherwise indicated, listed or approved by a nationally recognized testing laboratory (NRTL).

COM. Customer owned material.

Dormitories. Dormitories include buildings or spaces in buildings where group sleeping accommodations are provided for more than 16 persons who are not members of the same family, in one room or a series of closely associated rooms, under joint occupancy and single management, with or without meals, but without individual cooking facilities.

Enclosed Spaces. Those spaces within an occupancy that are completely separated from public spaces by a "smoke barrier". Included are hotel rooms, individual apartments, and enclosed offices.

Molded Seating. Furniture formed by molding resin formulations which may have a textile or coated fabric cover or a padding material between the cover and the molded resin. Molded seating shall include plastic chairs.

NR. Not Regulated.

Nationally Recognized Testing Laboratory (NRTL). An organization which tests for safety and lists labels or accepts equipment or materials and which meets the criteria in 527 CMR 49.00 (Appendix C).

Public Spaces. Those spaces within an occupancy accessible by the public while the building is occupied. This shall include all components of the means of egress such as exit accesses and exits.

Regulated Seating. Any seating product, including upholstered furniture, re-upholstered furniture and molded seating regulated by 527 CMR 29.00.

Re-upholstered furniture. Existing upholstered furniture for which a new cover material or interior components are to be replaced.

Smoke Barrier. A continuous membrane, either vertical or horizontal, such as a wall, floor, or ceiling assembly and solid opening protection such as solid doors and windows, that is designed and constructed to restrict the spread of smoke. A smoke barrier may or may not have a fire resistance rating. Opening protective devices (doors, for example) shall be self- or automatic-closing.

Upholstered Furniture. Movable or stationary chairs, settees, sofas, banquettes, booths, auditorium chairs, divans, davenports, love seats, ottomans, studio couches, sleeper-sofas and similar equipment which are manufactured with leather, textile fabric or coated fabric exterior and padding materials including foamed plastic, fiberfill, cotton batting or other natural or synthetic fiber.

29.01: continued

Use Group. The classification of a building or structure based on the purpose for which it is used as listed in 780 CMR.

29.02: General Requirements

(1) Regulated seating shall include seating to be used in the Use Groups as indicated by 527 CMR 29.05: Table 1.

(2) Regulated seating shall not be purchased, leased or rented for use in a particular occupancy unless the intended user is provided with written notice from the manufacturer, supplier, vendor, distributor or an approved testing agency that the regulated seating conforms to 527 CMR 29.00.

(3) The head of the fire department shall be provided with a copy of the certification required by 527 CMR 29.02(2) and a notice that fire test reports and related documentation which demonstrate the certified compliance are available on request.

(4) The following articles shall be exempt from 527 CMR 29.00:
(a) Cushions and pads intended solely for outdoor use.
(b) Any article which is smooth surfaced and contains no more than ½ inch of filling material, provided that such article does not have a horizontal surface meeting vertical surface.
(c) Articles manufactured solely for recreational use or physical fitness purposes, such as weight lifting benches, gymnasium mats or pads, side horses and similar articles.

29.03: Requirements for Upholstered Furniture and Molded Seating

(1) On and after May 1, 1994, all regulated seating sold for use in the Commonwealth of Massachusetts, except as provided in 527 CMR 29.03(4), shall meet the test criteria set forth in the State of California, Bureau of Home Furnishings and Thermal Insulation Technical Bulletin Number 133, entitled "Flammability Test Procedure For Seating Furniture For Use In Public Occupancies," dated January 1991, or tested in accordance with ASTM E 1537-93, "Standard Test Method for Fire Testing of Real Scale Upholstered Furniture Items," and meeting the test criteria of California Technical Bulletin 133.

(2) The following label shall be attached to every article of regulated seating complying with Technical Bulletin 133:
NOTICE: THIS ARTICLE IS MANUFACTURED FOR USE IN PUBLIC OCCUPANCIES AND MEETS THE FLAMMABILITY REQUIREMENTS OF CALIFORNIA BUREAU OF HOME FURNISHINGS TECHNICAL BULLETIN 133. CARE SHOULD BE EXERCISED NEAR OPEN FLAME OR WITH BURNING CIGARETTES.

(3) The minimum size of the label shall be two inches by three inches and the minimum size of the type shall be ⅛ inch in height. All type shall be in capital letters.

(4) In occupancies protected throughout with automatic sprinklers installed in accordance with 780 CMR, "Mass. State Building Code," 5th edition, regulated seating shall conform with California Technical Bulletin 133 as indicated in 527 CMR 29.03(1), 29.03(2) and 29.03(3) or shall meet the test requirements set forth in the State of California, Bureau of Home Furnishings and Thermal Insulation Technical Bulletin 117, "Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used In Upholstered Furniture," dated January 1980.

(5) The following label shall be attached to every article of regulated seating complying with Technical Bulletin 117:
NOTICE: THIS ARTICLE MEETS ALL FLAMMABILITY REQUIREMENTS OF CALIFORNIA BUREAU OF HOME FURNISHINGS BULLETIN 117. CARE SHOULD BE EXERCISED NEAR OPEN FLAME OR WITH BURNING CIGARETTES.

(6) The minimum size of the label shall be two inches by three inches and the minimum size of the type shall be ⅛ inch in height. All type shall be in capital letters.

29.03: continued

(7) When the automatic sprinkler option is utilized for compliance with 527 CMR 29.00, listed "residential" or "quick response" sprinklers shall be used when in conformance with the listing and installation requirements. All other building areas may use standard spray sprinkler heads.

29.04: Requirements for Re-upholstered Furniture

(1) Any re-upholstered furniture shall, at a minimum, provide the equivalent level of safety to that provided by:

(a). The State of California, Bureau of Home Furnishings and Thermal Insulation Technical Bulletin Number 133, entitled "Flammability Test Procedure For Seating Furniture For Use In Public Occupancies, dated January 1991",

(b) This can be accomplished by re-upholstering furniture with components meeting The State of California, Bureau of Home Furnishings and Thermal Insulation Technical Bulletins Numbers 116 and 117.

(2) The occupancies regulated shall be the same as for new furniture.

(3) The re-upholsterer shall affix a tag with their name and address, the date the re-upholstery was completed and a statement indicating compliance with 527 CMR 29.04(1).

29.05: Table 1

REGULATED SEATING UNDER 527 CMR 29.00

Use Group	
A - Assembly	Yes
B - Business	NR
E - Educational	Yes
F - Factory and Industrial	NR
H - High Hazard	NR
I - Institutional	Yes
M - Mercantile	NR
R - Residential, R-1	
public space	Yes
enclosed space	Yes
Residential, R-2	
public space	Yes
dormitories	Yes
other enclosed space	NR
Residential, R-3 and R-4	
public space	Not Applicable
enclosed space	NR
Residential, R-5	
public space	Not Applicable
enclosed space	Yes
S - Storage	NR
U - Utility and Miscellaneous	NR

29.06: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 29.00 shall be considered a part of the requirements of 527 CMR 29.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 29.00: M.G.L. c. 148, §§ 10 and 28.

527 CMR 30.00: UNVENTED PROPANE OR NATURAL GAS-FIRED SPACE HEATERS

Section

30.01: Purpose
30.02: Scope
30.03: Definitions
30.04: Installation
30.05: Maintenance and Operation

30.01: Purpose

The purpose of 527 CMR 30.00 is to provide requirements for the installation, maintenance, and operation of unvented propane or natural gas-fired space heaters.

30.02: Scope

527 CMR 30.00 shall apply to unvented propane or natural gas-fired space heaters installed in occupancies used in whole or in part for habitation on or after April 1, 2004. 527 CMR 30.00 shall not apply to unvented propane or natural gas-fired space heaters not used in habitated spaces or those installed in accordance with 527 CMR 20.00.

30.03: Definitions

Malfunction, shall mean a condition where a space heater fails to operate properly as provided in the manufacturer's instructions

Oxygen Depletion Safety Shutoff System (ODS): A device utilized to shut off the gas supply to the pilot or main burner when the oxygen in the surrounding atmosphere is depleted to the percent concentration developed by the manufacturer, but under no circumstances shall the concentration be less than 18% oxygen concentration.

Primary Heat: A heat source that is permanently installed and used exclusively to provide heat to the entire structure (*e.g.* forced hot water, forced hot air) by means of a central furnace or boiler which has a permanent fuel source (*e.g.* oil, natural gas or LPG) or electric heat. 527 CMR 30.03: Primary Heat shall not include fireplaces or wood stoves.

Unvented Natural or Propane Gas-Fired Space Heater: A permanently installed stand alone gas-fired unvented room heater or gas-fired unvented decorative room heater for connection to the house fuel supply system which utilizes natural gas or propane. Unvented gas-fired space heaters may be used only for supplemental heat and/or decorative purposes and under no circumstances shall they provide a primary heat source. Unvented gas-fired space heaters shall comply with ANSI Standard Z21.11.2 – 2000 edition, Volume II.

30.04: Installation

(1) A permit shall be obtained from the head of the fire department and the local or state gas inspector having jurisdiction for the installation of all unvented propane or natural gas-fired space heaters. Said permits shall be conditioned upon final inspection and approval of installation by the head of the fire department and the local or state gas inspector having jurisdiction. A copy of the manufacturer's installation/operating literature shall be submitted with each permit application. Before operation, the Head of the Fire Department and the local or state gas inspector shall inspect the installation for compliance with 527 CMR and 248 CMR (Board of State Examiners of Plumbers and Gas Fitters).

(2) Unvented propane or natural gas-fired space heaters shall conform to ANSI Z21.11.2, be equipped with an oxygen depletion safety (ODS) shutoff system and be listed and approved in accordance with 248 CMR.

(3) Unvented propane or natural gas-fired space heaters shall be installed in accordance with their listings and the manufacturer's instructions. Proper clearances to combustibles shall be maintained. In no case shall the clearances be such as to interfere with combustion air and accessibility.

30.04: continued

(4) Installations shall be of a permanent type, with a permanently piped fuel supply in accordance with 248 CMR. LPG appliances shall be subject to the storage requirements in accordance with 527 CMR 6.00. Portable unvented propane or natural gas-fired space heaters shall be prohibited.

(5) Unvented propane or natural gas-fired space heaters shall be prohibited in bedrooms and bathrooms.

(6) Space heaters shall be properly sized for the room or space of installation, but shall not exceed a maximum of 40,000 BTU input per room or space.

(7) In occupancies with an unvented propane or natural gas-fired space heater, at least one listed carbon monoxide detector shall be installed and maintained in any room or space where said heater has been installed in accordance with the manufacturers instructions. Any building wherein said heater is to be installed shall, as a precondition to such installation, have working smoke detectors installed and maintained in accordance with the requirements of 780 CMR (State Board of Building Regulations and Standards) in effect at the time of construction or if no said requirement was in effect at the time of construction, installed as provided for in M.G.L. c. 148, § 26E.

(8) In rooms and buildings served by an unvented propane or natural gas-fired space heater, a primary source of heat, which is operable, shall be permanently installed and maintained in said building in accordance with 105 CMR (Department of Public Health).

(9) Sellers of unvented propane or natural gas-fired space heaters shall provide to each purchaser a copy of 527 CMR 30.00 upon sale of the unit.

30.05: Maintenance and Operation

(1) The maintenance and operation of unvented propane or natural gas-fired space heaters shall be in accordance with the manufacturer's instructions. The manufacturer's instructions shall be left with the appliance and made available for any public official.

(2) Any malfunction of an unvented a space heater shall forthwith be reported by the owner to the head of the local fire department.

REGULATORY AUTHORITY

527 CMR 30.00: M.G.L. c. 148, § 25A.

527 CMR 31.00: CARBON MONOXIDE ALARMS

Section

31.01: Purpose and Scope
31.02: Definitions
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31.01: Purpose and Scope

The purpose of 527 CMR 31.00 is to provide minimum requirements for the type, installation, location, maintenance, and inspection of carbon monoxide alarms in every dwelling, building or structure in accordance with the provisions of M.G.L. c. 148, § 26F½. 527 CMR 31.00 shall apply to every dwelling, building or structure including those owned and operated by the Commonwealth, occupied in whole or in part for residential purposes, that:

(a) contains fossil-fuel burning equipment or
(b) incorporates enclosed parking within its structure.

31.02: Definitions

As used in 527 CMR 31.00, the following definitions shall have the meanings respectively assigned to them:

Adjacent Spaces shall mean any area, space, room or dwelling unit located directly next to, below or above any area space, room or dwelling unit that contains fossil fuel burning equipment or enclosed parking. It shall not include closets, bathrooms, cabinets or similar areas used for storage or utility purposes and temporarily occupied for activities relating to such storage or utility use.

Centralized Fossil Fuel Burning Equipment shall mean a central heating plant, hot water heater, a combustion driven generator or fire pump, central laundry equipment, roof mounted air handling unit or similar equipment that emits carbon monoxide as a by-product of combustion and does not allow for air exchange between Centralized Fossil Fuel Burning Equipment and Dwelling Units or common areas.

Carbon Monoxide Alarm Protection shall mean carbon monoxide alarm protection that may consist of either:

(a) battery powered in compliance with NFPA 720, 5.2.3 and wireless appliances, or
(b) ac (alternating current) plug-in with battery back up in accordance with NFPA 720, 5.2.2.6, or
(c) ac primary power source with battery back up in compliance with NFPA 720, 5.2.2, or
(d) low voltage or wireless systems with secondary power in compliance with NFPA 720, 5.2.4 , or
(e) Combination Appliance.

At a minimum, all such Carbon Monoxide Alarm Protection equipment shall operate as a Single Station Alarm Device or Single Station Carbon Monoxide Alarm.

Combination Appliance shall mean a combination photoelectric smoke detector and carbon monoxide alarm which may be battery or ac (alternating current) powered with battery back up. A combination ionization detector and carbon monoxide alarm which may be battery or ac (alternating current) powered, with battery back up, may be utilized if it is installed not less than 20 ft. from any bathroom or kitchen entryway. Such Combination Appliances shall employ both simulated voice and tone alarm features which clearly distinguishes between carbon monoxide and smoke notification, in accordance with NFPA 720, 5.3.4.

31.02: continued

Daycare Facility A facility licensed by the Commonwealth under M.G.L. c. 28A or its successor statues or regulations by the Department of Early Education and Care as a Child Care Center, School Aged Child Care Program, or Family Child Care Home, including Large Family Child Care and Family Child Care Plus.

Dwelling Unit A single unit providing facilities for living and sleeping.

Enclosed Parking A structure or an area or room, or floor or level thereof, enclosed within an the overall building or structure or attached thereto that is designed or used for the parking of vehicles and does not comply with the minimum exterior wall opening requirements in 780 CMR 406.1.1: *Open Parking Structure* (Massachusetts State Building Code).

Fossil Fuel Burning Equipment Any device, apparatus or appliance which is designed or used to consume fuel of any kind which emits carbon monoxide as a by-product of combustion.

Habitable shall mean that portion of a cellar, basement or attic that is designed, used or furnished for living purposes.

Head of the Fire Department shall mean the head of the Fire Department as defined in M.G.L. c. 148, § 1, or a designee of the head of the Fire Department.

Intermittent Ignition Device A device which ignites an automatic gas appliance to begin normal operation thereof, and which is activated only at the time such automatic gas appliance is to be so ignited.

Institutional Structures shall include any dwelling, building or structure classified as use group I-1 through I-3, as defined in 780 CMR and those unclassified occupancies that have the same characteristics as I-1 through I-3. Where there is a dispute regarding Use Group classification of a structure, a determination shall be made by the municipal or state building inspector having jurisdiction.

Listed A device listed by a Nationally Recognized Testing Laboratory meeting the requirements of 527 CMR 49.03: *Appendix C* and the standards in either IAS/CSA 6.19 or UL 2034 –Single and Multiple Station Carbon Monoxide Alarms, June 2002 Edition or UL 2075 –Gas and Vapor Detector Sensor, November 2004 Edition, as applicable for the installation.

Marshal shall mean the State Fire Marshal or a designee of the State Fire Marshal.

NFPA 720 shall mean National Fire Protection Association (NFPA) 720 entitled "Standard for the Installation of Carbon (CO) warning Equipment in Dwelling Units", 2005 Edition.

Residential Structures shall include any dwelling, building or structure classified as use group R-1 with less than six dwelling units or R-2 through R-5, as defined in 780 CMR and those unclassified occupancies that have the same characteristics as a R-1 with less than six dwelling units or R-2 through R-5. Where there is a dispute regarding Use Group classification of a structure, a determination shall be made by the municipal or state building inspector having jurisdiction.

Roof Mounted Fossil Fuel Burning Equipment. Any Fossil Fuel Burning Equipment mounted on top of a structure that is used to condition any medium through heating or cooling.

Single Station Alarm Device. An assembly that incorporates the detector, the control equipment, and the alarm-sounding device in one unit operated from a power source either located in the unit or obtained at the point of installation.

Single Station Carbon Monoxide Alarm. A detector comprising an assembly that incorporates a sensor, control components, and an alarm notification appliance in one unit operated from a power source either located in the unit or obtained at the point of installation.

31.02: continued

State Building Code. 780 CMR, Massachusetts State Building Code, (6th Edition).

Transient Residential Structures shall include any dwelling, building or structure classified as use group R-1 with six or more dwelling units, as defined in 780 CMR and those unclassified occupancies that have the same characteristics as R-1 with six or more dwelling units. Where there is a dispute regarding Use Group classification of a structure, a determination shall be made by the municipal or state building inspector having jurisdiction.

U.L. 2075 shall mean Underwriters Laboratory standard 2075 entitled "Standard for Gas and Vapor Detector Sensors", November, 2004 Edition.

31.03: General Installation Provisions

(1) Any carbon monoxide alarm using an ac (alternating current) primary power source and any other wired carbon monoxide alarm protection equipment shall be installed and maintained in accordance with the Massachusetts Electrical Code, 527 CMR 12.00 and in accordance with M.G.L. c. 143, § 3L and M.G.L. c. 141, § 1A, if applicable.

(2) Buildings or structures owned or operated by the Commonwealth or any local housing authority are exempt from the requirements of 527 CMR 31.04 until January 1, 2008.

(3) Buildings or structures constructed, renovated or subject to a change in use for which building permits have been issued on or after March 31, 2006, shall comply with any stricter carbon monoxide alarm requirements of The State Building Code, if applicable.

(4) The installation of carbon monoxide detectors in accordance with 527 CMR 30.00, relating to certain Unvented Propane or Natural Gas-fired Space Heaters, if applicable, shall satisfy the requirements of 527 CMR 31.00 for that level on which such heater is located, provided the installation complies with 527 CMR 31.04(1)(a)and (b).

(5) The installation of carbon monoxide detectors in accordance with 248 CMR, The Commonwealth of Massachusetts Fuel Gas and Plumbing Code, if applicable, shall satisfy the requirements of 527 CMR 31.00 for that level on which the direct vented gas appliance is located, provided the installation complies with 527 CMR 31.04(1)(a) and (b).

(6) Effective December 1, 2006, a permit shall be obtained from the Head of the Fire Department for all installations which employ one or more of the Carbon Monoxide Alarm protection options listed in 527 CMR 31.05. The Marshal shall prescribe a uniform application form for such permit.

31.04: Specific Installation Provisions

(1) Residential Structures. Effective March 31, 2006, every Residential Structure that presently or in the future contains Fossil Fuel Burning Equipment or has enclosed parking shall be equipped, by the owner, landlord or superintendent, with working and Listed Carbon Monoxide Alarm Protection.

(a) Carbon Monoxide Alarm Protection shall be located in each level of each Dwelling Unit including Habitable portions of basements, cellars and attics, but not including crawl spaces. The installation of said unit shall be located in accordance with the manufacturer's instructions.

(b) When mounting Carbon Monoxide Alarm Protection on a level of a Dwelling Unit with a sleeping area, the alarm shall be installed in the immediate vicinity of the sleeping area. At a minimum, the alarm shall be located outside of any bedroom, but shall not exceed ten ft. as measured in any direction from any bedroom door.

31.04: continued

(c) Alternative Compliance Options. Such Residential Structures, as an alternative to providing Carbon Monoxide Alarm Protection within each level of each Dwelling Unit, may be protected by using one or more of the Carbon Monoxide Protection Technical Options stated in 527 CMR 31.05(1)(a) through (g) if applicable. However, notwithstanding the use of any Alternative Compliance Option, Carbon Monoxide Alarm Protection shall also be installed in any Dwelling Unit that contains Fossil Fuel Burning Equipment in accordance with 527 CMR 31.04(1)(a) and (b).

(d) Alternative Compliance Deadline for Certain Installations. Any owner who intends to meet the requirements of 527 CMR 31.04 by installing either:

1. ac (alternating current) primary power source with battery back up or wired, low voltage, carbon monoxide alarm protection; or

2. an Alternative Compliance Option of 527 CMR 31.04(1)(c), shall not be required to complete such installation until January 1, 2007 if said owner provides written notification of such intent to the head of the fire department by May 15, 2006. The submission of such notification shall be deemed to be the consent by the owner to the future inspection of the subject building by the head of the fire department to determine compliance. Installation of carbon monoxide alarm protection pursuant to 527 CMR 31.04(1)(d) may be allowed not withstanding the late filing of the written notification, only upon the approval of the head of the fire department who may require temporary carbon monoxide alarm protection pending the completion of installation.

(2) Other Transient Residential and Institutional Structures Required to have Hard-wired Carbon Monoxide Alarm Protection by January 1, 2008.

(a) Effective January 1, 2008, every Transient Residential and Institutional Structure that presently or in the future contains Fossil Fuel Burning Equipment or has enclosed parking shall be equipped, by the owner, landlord or superintendent, with working and Listed Carbon Monoxide Alarm Protection as defined in 527 CMR 31.02 with the exception of 527 CMR 31.02: Carbon Monoxide Alarm Protection(a), (b) and (e) if battery powered, in each level of each dwelling unit.

(b) Alternative Compliance Option. Such Transient Residential and Institutional Structures, as an alternative to providing Carbon Monoxide Alarm Protection within each level of each Dwelling Unit, may be protected by using one or more of the Carbon Monoxide Protection Technical Options stated in 527 CMR 31.05(1)(a) through (h). However, notwithstanding the use of any Alternative Compliance Option allowed under 527 CMR 31.04(2)(b), Carbon Monoxide Alarm Protection shall also be installed in any Dwelling Unit that contains Fossil Fuel Burning Equipment in accordance with 527 CMR 31.04(2)(a).

(3) Day Care Facilities. A Day Care Facility classified as either a Child Care Center, School Aged Child Care Program, Family Child Care Home, including Large Family Child Care and Family Child Care Plus by the Department of Early Education and Care that presently or in the future contains Fossil Fuel Burning Equipment or has enclosed parking shall comply with the following, as applicable:

(a) Family Child Care Home, including Large Family Child Care and Family Child Care Plus facilities shall comply with 527 CMR 31.04(1)(a) and (b).

(b) Group Child Care and School Aged Child Care Program facilities shall install Carbon Monoxide Alarm Protection with Listed Carbon Monoxide Alarm Protection, as defined in 527 CMR 31.02, with the exception of 527 CMR 31.02: Carbon Monoxide Alarm Protection(a) and (e) if battery powered, in each room used by children for sleeping, learning, or participating in other early education and care activities.

(4) Roof Mounted Fossil Fuel Burning Equipment.

(a) All Residential Structures, Transient Residential Structures or Institutional Structures that presently or in the future employ Roof Mounted Fossil Fuel Burning Equipment that directly supplies air to dwelling units shall be equipped with Carbon Monoxide Alarm Protection as provided in 527 CMR 31.04(1)(a) and (b) or 527 CMR 31.04(2)(a), as applicable.

31.04: continued

(b) All Residential Structures, Transient Residential Structures or Institutional Structures that presently or in the future employ Roof Mounted Fossil Fuel Burning Equipment that directly supplies air to common areas and not to dwelling units shall be equipped with Carbon Monoxide Alarm Protection as provided in 527 CMR 31.04(1)(a) and (b) or 527 CMR 31.04(2)(a), as applicable or employ Type F Carbon monoxide protection as provided in 527 CMR 31.05(1)(f).

(c) All Residential Structures, Transient Residential Structures or Institutional Structures that presently or in the future employ Roof Mounted Fossil Fuel Burning Equipment that does not directly supply air to dwelling units or common areas: (Reserved)

31.05: Carbon Monoxide Protection: Technical Options

(1) Certain Residential Structures, Transient Residential Structures or Institutional Structures may present Carbon Monoxide risks in a limited or minimum portion of the structure rather than in each Dwelling Unit. The following technical options employ methods which may make it unnecessary to install Carbon Monoxide Alarm Protection in each level of each dwelling unit in accordance with 527 CMR 31.04(1)(a) and (b) or 527 CMR 31.04(2)(a), as applicable. Not withstanding the utilization of any technical option, or combination thereof, Carbon Monoxide Alarm Protection shall also be installed in any Dwelling Unit that contains Fossil Fuel Burning Equipment in accordance with 527 CMR 31.04(1)(a) and (b) or 527 CMR 31.04(2)(a).

(a) Type A. Carbon Monoxide protection for areas or rooms containing Centralized Fossil Fuel Burning Equipment, shall employ Listed Carbon Monoxide Alarm Protection meeting UL 2075, or a low voltage or wireless system. Such installation shall provide a visual or audible alarm in the rooms or areas containing the Fossil Fuel Burning Equipment. Such installation shall be in accordance with the manufacturer's instructions. Such protection shall be monitored in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner. In accordance with NFPA 720, 5.3.9.3(1) the retransmission of the signal shall be at the discretion of the head of the fire department.

(b) Type B. Carbon Monoxide protection for areas or rooms of Centralized Fossil Fuel Burning Equipment consisting of kitchen appliances equipped with an Intermittent Ignition Device, shall comply with 248 CMR Fuel/Gas Plumbing Code and the 2002 Edition of NFPA 54, §§ 10.3.4.5 or 10.3.5.2. A written certification shall be submitted to the Head of the Fire Department from a Registered Professional Engineer licensed by the Commonwealth certifying that the kitchen appliances meet 248 CMR and said NFPA 54.

(c) Type C. Carbon Monoxide protection for areas or rooms with Centralized Fossil Fuel Burning Equipment which employ an automatic integrated shutdown device which shall be directly connected to the fossil fuel burning equipment and an ac primary power source with battery back up in compliance with NFPA 720, 5.2.2 or low voltage or wireless systems in compliance with NFPA 720, 5.2.4 that will cause a shut down to the fossil fuel burning equipment upon activation of a carbon monoxide detector. The device must also provide an audible or visual alarm in the immediate area of the device and fossil fuel burning equipment. The fossil fuel burning equipment must be manually restarted after activation. A sign shall be mounted in the vicinity of the device with a minimum of 1 inch high letters in contrasting color with the following statement: "If the carbon monoxide detector has activated, do not restart the equipment until serviced by a qualified technician".

Exception: Such shut down requirement shall not be applicable to systems that are part of an emergency or standby system required by any municipal, state or federal law or regulation provided the Carbon Monoxide detection system shall be monitored in accordance with NFPA 720 5.3.9.

(d) Type D. Carbon Monoxide protection for adjacent spaces of structures, areas or rooms considered Enclosed Parking, shall employ Listed Carbon Monoxide Alarm Protection meeting UL 2075 or a low voltage or wireless system. Such installation shall provide a visual or audible alarm in the rooms or areas containing the Fossil Fuel Burning Equipment. Such protection shall be monitored in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner. In accordance with NFPA 720, 5.3.9.3(1), the retransmission of the signal shall be at the discretion of the head of the fire department.

(e) Type E. Carbon Monoxide protection for Enclosed Parking, shall employ, in the enclosed parking either:

31.05: continued

1. an automatic mechanical ventilation system that automatically operates upon detection of carbon monoxide in accordance with 780 CMR 2801.2, without exception or reduction and provides for a supervisory alarm at 50 ppm in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner in accordance with NFPA 720, 5.3.9.3(1), and the retransmission of the signal shall be at the discretion of the head of the fire department; or

2. The enclosed parking has continuous mechanical ventilation at a minimum rate in accordance with 780 CMR 2801.2, without exception or reduction. Such system shall employ a sensor to ensure the minimum airflow as designed is operating through the system. The sensor shall monitor direct airflow and shall be connected to the fire alarm panel as a supervisory alarm in accordance with NFPA 720, 5.3.9. A registered Professional Engineer licensed by the Commonwealth shall provide written certification to the head of the fire department that the subject enclosed parking meets the requirements of 527 CMR 31.05(1)(e).

(f) Type F. Carbon Monoxide protection for Roof Mounted Fossil Fuel Burning Equipment that circulate air from said unit to common areas only, shall be equipped with the following: A duct Carbon Monoxide gas detection device shall be installed on the discharge side of the Roof Mounted Air Handling Unit or the common areas on the floor closest to the initial supply discharge from the Roof Mounted Air Handling Unit. All such devices shall be installed in accordance with the manufacturer's instructions. The Carbon Monoxide gas detection device shall automatically alarm upon detection of carbon monoxide at 50 parts per million (ppm) and provide for a supervisory alarm in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner in accordance with NFPA 720, 5.3.9.3(1), and the retransmission of the signal shall be at the discretion of the head of the fire department. Upon activation of the Carbon Monoxide detection device and supervisory alarm, the roof mounted fossil fuel burning equipment shall shutdown until manually reset.

Exception: Such shut down requirement shall not be applicable to systems that are part of an emergency or standby system required by any municipal, state or federal law or regulation.

(g) Type G. Carbon Monoxide protection for Roof Mounted Fossil Fuel Burning Equipment that do not circulate air to any common area or dwelling unit, shall be equipped with the following: (Reserved)

(h) Type H. Carbon Monoxide protection for certain Institutional structures that contain Fossil Fuel Burning equipment that circulates air to patient rooms, inmate rooms or common areas. Carbon Monoxide protection for certain Institutional structures classified as either Use Group I-2 or I-3, that contain Fossil Fuel Burning equipment that circulates air to dwelling units occupied by patients or inmates may be equipped with type H protection if the following conditions are met:

1. Such structure contains dwelling units occupied by a person or persons who are not capable of self preservation due to age, mental disability, medical condition, incarceration, restraint or security; and
2. the occupants are under constant supervision on a 24 hour basis.

Type H protection shall include a duct Carbon Monoxide gas detection device which shall be installed downstream of air filters, ahead of any branch connections in air supply systems of the fossil fuel Air Handling Unit. All such devices shall be installed in accordance with the manufacturer's instructions. The Carbon Monoxide gas detection device shall automatically alarm upon detection of carbon monoxide at 50 parts per million (ppm) and provide for a supervisory alarm in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner in accordance with NFPA 720, 5.3.9.3 (1), and the retransmission of the signal shall be at the discretion of the head of the fire department. Upon activation of the Carbon Monoxide detection device and supervisory alarm, the fossil fuel burning equipment shall shutdown until manually reset.

Exception: Such shut down requirement shall not be applicable to systems that are part of an emergency or standby system required by any municipal, state or federal law or regulation.

31.06: Inspection and Maintenance Requirements

The head of the fire department or designee shall enforce the provisions of 527 CMR 31.00, including the inspection for conformance with the carbon monoxide alarm requirements, upon sale or transfer of such dwelling, building or structure used in whole or in part for residential purposes.

31.07: Landlord Installation, Inspection and Maintenance Duties

(1) Every owner, superintendent, or landlord shall, at a minimum, maintain, test, repair, or replace, if necessary, every carbon monoxide alarm upon renewal of any lease term for any dwelling unit or on an annual basis, whichever is more frequent. All common areas shall be inspected annually. All carbon monoxide alarm batteries shall be replaced, on an annual basis by the owner, landlord or superintendent.
Exception: Low voltage system batteries shall be maintained in accordance with applicable sections of NFPA 720.

(2) The owner, superintendent, or landlord of every structure that employs one or more of the Carbon Monoxide Protection Technical Options listed in 527 CMR 31.05 shall be responsible for the care and maintenance of such equipment and devices. Annually, the owner, superintendent or landlord of every structure shall submit to the head of the fire department a record of inspection, maintenance and testing on a form prescribed by the Marshal. Carbon monoxide systems shall not be disconnected or otherwise rendered unserviceable without first notifying the fire department in accordance with M.G.L. c. 148, § 27A.

31.08: Carbon Monoxide Alarms Installed in Dwelling Units Inhabited by a Persons Who Are Hearing Impaired

Every owner, superintendent, or landlord having control of any dwelling unit inhabited by a person who is hearing impaired, shall comply with any carbon monoxide provisions, if applicable, established by the Architectural Access Board pursuant to 521 CMR.

31.09: Emergency Planning

The owner, superintendent or landlord of every structure that employs carbon monoxide alarm protection by utilizing one or more of the Carbon Monoxide Protection Technical Options listed in 527 CMR 31.05 shall prepare a written emergency plan that is in effect and available to all personnel. The plan shall be presented to and approved by the head of the fire department. The plan shall include at a minimum:

(a) An annual review by the owner, superintendent or landlord of the plan with all employees who shall be kept informed in respect to their duties and responsibilities under the plan;
(b) The development of a policy and procedure A means to communicate the immediate situation the alarm to the local fire department and advise them of the immediate situation.;
(c) An evacuation plan; and
(d) A list of emergency contact phone numbers of responsible parties.

REGULATORY AUTHORITY

527 CMR 31.00: M.G.L. c. 148, §§ 26F½ and 28.

NON-TEXT PAGE

(527 CMR 32.00 AND 33.00: RESERVED)

NON-TEXT PAGE

527 CMR 34.00: RUBBISH HANDLING

Section

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34.01: Scope

527 CMR 34.00 shall apply to the storing or handling of combustible rubbish inside of or in the vicinity of any building or structure.

34.02: Definitions

For the purpose of 527 CMR 34.00, the following terms shall have the meanings respectively assigned to them:

Building: A structure enclosed within exterior walls or firewalls, built, erected and framed of a combination of any materials, whether portable or fixed, having a roof, to form a structure for the shelter of persons, animals or property. For the purpose of this definition, "roof" shall include an awning or similar covering, whether or not permanent in nature. The word "building" shall be construed where the context requires as though followed by the words "or parts thereof".

Combustible Rubbish: Any fragmented combustible material regardless of value, and any combustible waste material, including floor sweepings, paper packing, upholstery materials, cardboard, shavings, wood scrap, furniture, hay, straw, grass, combustible fiber materials, clothing, bed clothing, by-product waste from industrial operations, mixtures of any of these, or similar combustible materials in any proportions.

Listed: Equipment or materials included in a list published by an organization acceptable to the Marshal, and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that equipment or materials meet appropriate standards or have been tested and found suitable for use in a specific manner.

Owner: Every person who alone or jointly or severally with others:
(a) has legal title to any building or structure; or
(b) has care, charge, or control of any building or structure in any capacity including but not limited to agent, executor, executrix, administrator, administratrix, trustee or guardian of the estate of the holder of legal title; or
(c) lessee under a written letting agreement; or
(d) mortgagee in possession; or
(e) agent, trustee or other person appointed by the courts. Each such person shall to comply with the provisions of 527 CMR 34.00.

Self-Closing Fire Door: A fire door that returns to the closed position when opened and released and which in combination with a frame, hardware, and other accessories provides a specific degree of fire protection to the opening.

Structure: A combination of materials assembled at a fixed location to give support or shelter, such as a building, framework, retaining wall, tent, reviewing stand, platform, bin, fence, sign, flagpole, recreational tramway, mast for radio antenna, or the like. The word "structure" shall be construed, where the context requires, as though followed by the words, "or part or parts thereof".

34.02: continued

Waste Compactor: Any device using electrical, hydraulic or mechanical means to reduce the volume of waste and package it into a smaller unit of size.

Waste Storage Room: Any room used for the keeping, storage or handling of combustible rubbish of six cubic yards or more; loose, baled or compacted.

34.03: Permits Required

The owner, lessee or refuse generator of any premises shall obtain a permit from the head of the fire department for rubbish containers, which are emptied by mechanical assistance, of six cubic yards or more in the aggregate of compacted or uncompacted combustible rubbish. Permits shall state container location(s) and the name and telephone number of the company or person who can be reached in an emergency.

No permit shall be required for containers which are delivered to a location and removed in the course of a single business day.

34.04: Special Hazard Rubbish

(1) Hot coals, cinders, hot scrap metal, and similar substances shall not be deposited in combustible containers, or kept or stored so as to ignite combustible material. Such substances shall not be mixed with combustible rubbish or stored in the same containers. Such substances shall be kept, handled, or stored inside buildings only in noncombustible receptacles approved by the head of the fire department for that purpose and location. Such substances shall be kept, handled, or stored outside of building locations so that they cannot ignite buildings on the premises or adjacent premises and will not endanger people.

(2) Substances subject to spontaneous heating or ignition, such as oily or greasy rags, or other materials or combinations of materials, shall not be deposited in combustible containers or so kept or stored as to ignite combustible material. Such substances shall not be mixed with combustible rubbish or stored in the same containers. Materials subject to spontaneous ignition shall be kept in listed metal receptacles equipped with self-closing hinged covers designed to guard against the hazard of spontaneous combustion. Contents shall be emptied every night and disposed of properly.

(3) Materials such as those compounded with hazardous chemicals which tend to be reactive with other materials shall not be mixed with combustible rubbish or kept, handled, or stored in the same containers. Such materials shall be kept or stored in containers approved by the head of the fire department. Hazardous waste shall be disposed of in accordance with the regulations of the state Department of Environmental Protection (DEP).

34.05: Containers

(1) Rubbish containers when they are small enough to be moved by one person shall have a removable or hinged cover which shall be kept in place unless the container is being filled or emptied.

(2) Containers which require mechanical assistance to be moved shall be provided with a means of access to their interior, without disconnecting from a compactor unit or they shall have a minimum port opening of two inches in diameter through which water may be introduced for extinguishing fire. The port opening shall be labeled "FIRE HOSE PORT" or similar wording. Containers which are not part of a compactor unit shall not be required to have the additional openings or hose connections for fire extinguishment, if they are provided with a cover to make the contents accessible during firefighting operations. The cover of such a container shall remain closed except when the container is being filled or emptied. 527 CMR 34.05(2) shall apply to containers installed or replaced after 8/28/92. Containers in use subsequent to 8/28/92 shall be retrofitted to comply with the provisions of 527 CMR 34.00 by 8/28/95.

34.05: continued

(3) Containers shall not be placed at any location as to become an obstacle to the egress of persons from buildings or to vehicle traffic or as to obstruct operations of the fire department personnel during a fire or other emergency.

(4) Containers which require mechanical assistance to be moved, shall be marked with the name and telephone number of the company or person from which emergency service to expedite movement of the container can be obtained.

(5) Containers adjacent to buildings shall not be placed so the top of the container is less than five feet vertically and horizontally below any window or other opening, unless otherwise approved by the head of the fire department.

34.06: Waste Storage Rooms

(1) All openings in waste storage rooms shall be protected by automatic self-closing fire doors. These doors may not open into paths of egress.

(2) A room of a building or structure shall comply with the requirements for a waste storage room if it is used for keeping, handling, or storing of rubbish, loose, compacted or baled in an amount exceeding six cubic yards for more than 24 hours.

(3) Waste storage rooms shall not contain boilers or furnaces used for the central heating of buildings.

(4) Waste storage rooms shall be provided with automatic sprinklers installed in accordance with 780 CMR. The domestic cold water supply shall be acceptable for the automatic sprinkler feed. A minimum one half inch diameter hand hose of adequate length to reach all portions of the room shall be provided.

34.07: Waste Chutes

(1) Interior waste chutes shall be installed in accordance with the provisions of NFPA 82 and shall terminate in waste storage rooms as defined in 527 CMR 34.02.

(2) Instructions describing the size and type of waste which may be deposited in the chute shall be posted at each service opening.

(3) Waste chutes used in conjunction with the construction, repair or alteration of a building shall discharge to the outside.

34.08: General

(1) Combustible rubbish or rubbish in combustible containers shall not be kept, handled, or stored in any building for more than 24 hours except in a waste storage room conforming to the requirements of 527 CMR 34.06.

(2) All container units which can be moved without mechanical assistance shall, at the end of each rubbish collection cycle, be emptied and the contents properly stored in a waste storage room, or the container and contents shall be stored in a waste storage room.

34.09: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 34.00 shall be considered a part of the requirements of 527 CMR 34.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 34.00: M.G.L. c. 148, § 10.

NON-TEXT PAGE

527 CMR 35.00: CROP RIPENING OR COLOR PROCESSES

Section

35.01: Scope
35.02: Definitions
35.03: Permits Required
35.04: Fire Safety Requirements

35.01: Scope

527 CMR 35.00 shall apply to the equipment and operations for the process of ripening bananas, tomatoes, pears or honeydew melons, and coloring tobacco, citrus fruits or other crops in tightly closed rooms, and shall include those processes where ethylene gas is introduced into the room to assist these processes.

35.02: Definitions

For the purpose of 527 CMR 35.00 the following terms shall have the meanings respectively assigned to them:

Approved: Approved by the State Fire Marshal.

Combustible Liquid: Any liquid having a flash point at or above 100°F shall be known as Class II or III liquids. Combustible liquids shall be divided into the following classifications:

Class IA. Liquids having flash points below 73°F. and having a boiling point below 100°F.

Class IB. Liquids having flash points below 73°F. and having a boiling point at or above 100°F.

Class IC. Liquids having flash points at or above 73°F. and below 100°F.

Class II. Liquids having flash points at or above 100°F and below 140°F.

Class IIIA. Liquids having flash points at or above 140°F and below 200°F.

Class IIIB. Liquids having flash points at or above 200°F.

Compressed Gas: Any material or mixture having in the container as absolute pressure exceeding 40 psi at 70°F or, regardless of the pressure at 70°F, having an absolute pressure exceeding 140 psi at 130°F; or any flammable liquid material having a vapor pressure exceeding 40 psi absolute at 100°F as determined by ASTM D323.

Flammable Compressed Gas: Either a mixture of 13% or less (by volume) with air forms a flammable mixture, or the flammable range with air is wider than 12% regardless of the lower limitation. These limitations shall be determined at atmospheric temperature and pressure.

Flammable liquid: Any liquid having a flash point below 100°F. and having a vapor pressure not exceeding 40 psi at 100°F. Flammable liquids shall be known as Class I liquids and shall be divided into the following classifications:

35.03: Permits Required

(1) A permit shall be obtained from the head of the fire department for any crop ripening or color process.

(2) Where that process involves the storage, handling, and use of a flammable compressed gas or a combustible or flammable liquid, a permit shall also be obtained from the head of the fire department under the provisions of 527 CMR 14.00.

35.04: Fire Safety Requirements

(1) General: The layout, arrangement and construction of buildings and structures in which the process of ripening or coloring of crops is conducted shall comply with the applicable requirements of 780 CMR (the State Building Code) listed in Appendix A for the appropriate use group classification, and shall be provided with fire protection and fire extinguishing equipment as required by 780 CMR. Buildings and structures and their service equipment shall be maintained in safe and sound condition as required by 527 CMR.

(2) Ethylene: The location of buildings in which crop ripening or coloring processes utilizing gas containers of ethylene are conducted shall be approved by the head of the fire department.

(a) Distribution: The method for introducing ethylene shall provide positive control. The ethylene shall be measured so that the quantity introduced does not exceed one part ethylene to 1,000 parts of air.

(b) Containers: Ethylene gas containers other than those connected for use shall be stored outside of the building or in a special building except that not more than two portable Department of Transportation (DOT) containers not connected for use shall be stored inside of the building premises. Such inside rooms or portions of buildings used for storage of these containers shall be constructed so that walls or partitions, floors and ceiling have fire resistance ratings as required by the applicable provisions of 780 CMR (the State Building Code) listed in Appendix A.

(c) Piping: Ethylene piping shall be of steel pipe. Flexible connectors and hose, when used shall be listed. Tubing shall be of brass or copper with not less than 0.049 inch (1.24mm) wall thickness.

(3) Electrical Equipment: Electrical wiring and equipment shall be installed as specified in 527 CMR 12.00

(4) Heating: Heating of ripening and coloring rooms shall be by indirect means with low pressure steam, hot water or warm air; approved electric heaters; or listed gas heaters or listed kerosene heaters both of which shall have sealed combustion chambers.

(a) Steam and hot water pipes and radiators shall have a clearance of at least one inch (25mm) to combustible material.

(b) Gas heaters and their vents shall be installed in accordance with 248 CMR (Massachusetts State Plumbing and Gas Code) listed in Appendix A. Gas heaters shall be equipped with an automatic pilot device to shut off the gas supply whenever the flame is extinguished.

(c) Burners for gas or kerosene heaters shall be installed so that air for combustion is taken from outside the ripening or coloring room and the products of combustion are discharged outside the building.

(d) Kerosene heaters shall be installed in accordance with the applicable provisions of 527 CMR 4.00 and the BOCA Mechanical Code listed in Appendix A.

(e) Electric heaters shall be of a type not having an exposed surface at a temperature higher than 800°F, (427°C.) and with thermostatic elements which do not produce sparks. They shall be of a type approved for use in Class I, Division I Hazardous location.

(f) A protective guard shall be provided around any heater to prevent the possibility of its being knocked over by other equipment such as vehicles or lift trucks.

(5) Open flames: Open flame heater and unenclosed lights shall not be permitted in ripening or coloring room using ethylene from gas tanks or cylinders. NO SMOKING signs shall be posted at every entrance and smoking shall be prohibited in the ripening or coloring rooms.

(6) Housekeeping: Rooms for ripening or coloring shall be frequently cleared of all combustible material.

REGULATORY AUTHORITY

527 CMR 35.00: M.G.L. c. 148, § 10.

(527 CMR 36.00: RESERVED)

NON-TEXT PAGE

527 CMR 37.00: PESTICIDE STORAGE

Section

37.01: Scope
37.02: Definitions
37.03: General Requirements

37.01: Scope

(1) 527 CMR 37.00 shall apply to both inside and outside storage of all forms of pesticides in portable containers other than fixed installation on transportation equipment.

(2) Exceptions: Storage in dwellings or private garages of pesticides registered by the Environmental Protection Agency and the State Department of Environmental Protection for use around the home.

37.02: Definitions

(1) For the purpose of 527 CMR 37.00 the following terms shall have the meanings respectively assigned to them:

Combustible Liquid: Any liquid having a flash point at or above 100°F. shall be known as a class II or III liquid. Combustible liquids shall be divided into the following classifications:

Class IA. Liquids having a flash point below 73°F and having a boiling point below 100°F.

Class IB. Liquids having flash point below 73°F and having a boiling point at or above 100°F.

Class IC. Liquids having a flash point at or above 73°F and below 100°F (see "Combustible Liquids" for Class II or III liquids.)

Class II. Liquids having a flash point at or above 100°F and below 140°F Class IIIA. Liquids having a flash point at or above 140°F and below 200°F.

Class IIIB. Liquids having a flash point at or above 200°F.

Flammable Compressed Gas: Either a mixture of 13% or less (by volume) with air forms a flammable mixture, or the flammable range with air is under 12% regardless of the lower limit. These limits shall be determined at atmospheric temperature and pressure.

Flammable Liquid: Any liquid having a flash point below 100°F and having a vapor pressure not exceeding 40 psi at 100°F Flammable liquids shall be known as Class I liquids and be divided into the following classifications:

Highly Toxic Material: Any substance which falls within any of the following categories:
(a) Oral toxicity: Produces death within 14 days in half or more than half of a group of ten or more laboratory white rats, each weighing between 200 and 300 grams, at a single dose of 50 milligrams or less per kilogram of body weight, when orally administered.
(b) Toxicity or Inhalation: Produces death within 14 days in half or more than half of a group of ten or more laboratory white rats, each weighing between 200 and 300 grams, when inhaled continuously for a period of one hour or less at an atmospheric concentration of 200 parts per million by volume or less of gas or vapor or two milligrams per liter by volume or less of mist or dust.

37.02: continued

(c) Toxicity by skin absorption: Produces death within 14 days in half or more than half of a group of ten or more rabbits tested in a dosage of 200 milligrams or less per kilogram of body weight, when administered by continuous contact with the bare skin for 24 hours or less. Mixtures of these materials with ordinary materials, such as water, does not necessarily warrant a classification of highly toxic. While this system is basically simple in application, any hazard evaluation which is required for the precise categorization of this type of material shall be performed by experienced, technically competent persons.

Oxidizing Material: Substance such as chlorates, permanganates, peroxides, or nitrates, that yield oxygen readily to stimulate combustion.

Pesticide: Any material used to control, destroy or mitigate pests and including but not limited to the following: acaricides, insecticides, nematocides, fungicides, herbicides, algaecides and rodenticides.

Toxicity: That property of a material which enables it to injure the physiological mechanism of an organism by chemical means.

37.03: General Requirements

(1) Pesticides that are flammable compressed gases or flammable or combustible liquids shall be stored in accordance with the provisions of 527 CMR 37.00.

(2) Reserved

(3) Pesticides shall not be stored in the same area as herbicides.

(4) Pesticide storage shall not be stored in the same area with ammonium nitrate fertilizer.

(5) Pesticide storage shall be restricted to a first-story room or area which has direct access to the outside. Pesticides shall not be stored in basements. Storage areas shall be designed in a manner so as to prevent unauthorized entry.

(6) Pesticides in containers which could be damaged by moisture of water shall be stored off the floor.

(7) Damaged or leaking containers of pesticides or materials contaminated by pesticides shall be immediately separated, disposed of or decontaminated in accordance with required regulations.

(8) Pesticide storage shall be constructed in such a manner so that run-off from fire streams will not contaminate streams, ponds, ground water, crop lands or buildings.

Storage areas: areas used for the storage or mixing of pesticides shall be constructed in accordance with 780 CMR (the State Building Code) and the BOCA Mechanical Codes listed in 527 CMR 12.00 Appendix A.

(9) Toxicity data: Material Safety Data Sheets (MSDS) for each toxic pesticide shall be available at each storage location.

(10) Placarding: Pesticide storage buildings, storage rooms and areas shall be identified by prominent and legible signs according to applicable sections NFPA 43D 1986.

(11) Display: Drums and package shall be stacked in a safe manner and shall not be stored near any food materials.

37.03: continued

(12) Compressed gas pesticides: Compressed gas pesticides shall be stored away from heat such as steam pipes and direct sunlight.

(a) Securing of cylinders: All compressed gas cylinders in service or storage shall be protected to insure against being knocked over.

(b) Separation: Compressed gas pesticide containers shall be separated from other compressed gases.

(c) Safety caps: Containers shall be tightly closed and provide with a safety cap when not in use, whether empty or full.

REGULATORY AUTHORITY

527 CMR 37.00: M.G.L. c. 148, § 10.

NON-TEXT PAGE

(527 CMR 38.00: RESERVED)

NON-TEXT PAGE

527 CMR 39.00: WELDING AND CUTTING PROCESSES

Section

39.01: Purpose
39.02: Scope
39.03: Definitions
39.04: Permits Required
39.05: General Requirements
39.06: Fire Safety Requirements
39.07: Oxyfuel Gas Welding and Cutting
39.08: Electric Arc Welding and Cutting
39.09: Referenced Publications

39.01: Purpose

The purpose of 527 CMR 39.00 is to provide minimum standards to prevent loss of life and property from fire during cutting and welding processes involving the use of oxygen-fuel gas and electric arc cutting and welding equipment.

39.02: Scope

527 CMR 39.00 shall apply to the use of electric arc cutting and welding equipment and to the use of oxygen-fuel gas cutting and welding systems comprised of a single cylinder of oxygen, a single cylinder of fuel gas, regulators, hose and a torch.

39.03: Definitions

For the purpose of 527 CMR 39.00, the following terms shall have the meanings respectively assigned to them:

Acetylene, medium pressure: Acetylene at pressures exceeding two psig but not exceeding 15 psig.

Approved: Approved by the State Fire Marshal.

Compressed Gas: Any material or mixture having in the container an absolute pressure exceeding 40 psia (276 kPa absolute) at 70°F (21.1°C), or regardless of pressure at 70°F (21.1°C), having an absolute pressure exceeding 104 psia (717 kPa absolute) at 130°F (54.4°C).

Fire Resistant: Refers to materials which are noncombustible throughout and can withstand a fire completely consuming adjacent combustibles without collapse.

Fuel Gas: Acetylene, hydrogen, LP-Gas, and other liquefied and nonliquefied gases, any of the following hydrocarbons or mixtures of the same: propane, propylene, butanes (normal or isbutane), and butylenes.

Noncombustible Material: Any material which, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors, when subjected to fire or heat. Materials reported as noncombustible when tested in accordance with the Standard Method of Test for Noncombustiblility of Elementary Materials, ASTM E136, shall be considered noncombustible materials.

Permit system: Administrative procedures that provide authorization for a management control of welding and cutting operations. The management control shall include supervisory responsibility for the safe conduct of the welding and cutting. A permit system and associated safety practices shall be in conformance with a nationally recognized consensus standard, model fire prevention code, insurance or industry practice or United States Department of Labor OSHA regulations such as the following:

(a) 29 CFR 1910.225 Subpart Q, Welding, Cutting and Brazing.

39.03: continued

(b) American Petroleum Institute Publication 2009, *Safe Welding and Cutting Practices in Refineries, Gasoline Plants and Petrochemical Plants*, 5th ed., August, 1988.
(c) American Welding Society ANSI/AWS Z49.1-1988, *Safety in Welding and Cutting*.
(d) Building Officials and Code Administrators, *The BOCA National Fire Prevention Code*, 1993 edition; Chapter 22 Welding or Cutting, Calcium Carbide and Acetylene Generators.
(e) Factory Mutual Publication P9104, *Hot Work Policy, Precautions and Permission*.
(f) National Fire Protection Association, NFPA 51B-1994 ed., *Standard for Fire Prevention in Use of Cutting and Welding Processes*.

Person: Includes a corporation, firm, partnership, association, organization and any other group acting as a unit as well as individuals.

39.04: Permits Required:

(1) A permit shall be obtained from the head of the fire department by the person performing welding or cutting operations. The permit shall specify the time and exact location of the work to be performed, the nature of the work to be done, and any special precautions to be taken during that work.
EXCEPTION: A permit shall not be required for the following conditions:
(a) Whenever welding or cutting is performed in areas approved for the purpose by the head of the fire department.
(b) For each welding or cutting job location where a permit system has been approved by the head of the fire department after which a permit shall have been issued for the area where the management has control as required under the permit system.
(c) For welding and cutting by persons employed by companies or firms engaged in the storage, transportation, or distribution of natural gas under the jurisdiction of the Massachusetts Department of Public Utilities according to 220 CMR 100.00 through 112.00, and/or the United States Department of Transportation, Office of Pipeline Safety according to 49 CFR 191 through 193.

(2) Prior to the issuance of the permit the applicant shall provide written authorization signed by the property owner or his agent describing the scope and specific locations where the work is to be performed.

(3) A permit for the storage of fuel gases during welding or cutting operations shall be obtained from the head of the fire department under the provisions of 527 CMR 6.00 or 527 CMR 14.00. The head of the fire department may issue a single permit for both operation (527 CMR 39.04(1)) and storage (527 CMR 39.04(3)).

39.05: General Requirements

(1) In the performance of welding and cutting operations, only approved equipment shall be used and the equipment shall be installed and operated in accordance with 527 CMR 39.00, the manufacturer's instructions, and nationally recognized good practice.

(2) A permit for welding or cutting operations shall not be issued unless the individual in charge of performing such operations is deemed to be capable of doing such work in a safe manner by the head of the fire department. Demonstration of a knowledge of 527 CMR 39.00 and equipment operations shall constitute acceptable evidence of compliance with 527 CMR 39.05.

(3) A fire watch shall be provided to safeguard against the ignition of any material by the welding or cutting operation, to make use of portable fire extinguishers or fire hose, and to perform similar fire prevention and fire protection duties. The fire watch shall remain on the job at least 30 minutes after the welding or cutting operations have been completed to insure that no fire exists. A signed inspection report attesting to that fact shall be filed and available for inspection by the head of the fire department.

39.04: continued

(4) A record shall be maintained of all locations where welding or cutting operations are performed. The record shall state the name of the assigned fire watch or watches and the length of time for which the fire watch standby was continued after work was completed (a minimum of 30 minutes). It shall include the date, time, and specific location at which work was done and describe the work, fire protection provided, and special precautions taken. Individual job authorizations shall be kept available at all times for inspection by the head of the fire department or his designee. The assigned fire watch or fire watches shall sign the work authorization attesting to the fact that no fire existed after the work ceased and the standby period had passed.

(5) Where welding or cutting is done near walls, partitions, ceiling, or roof of combustible construction, fire resistant shields or guards shall be provided to prevent ignition. When welding or cutting is to be done on a metal wall, partition, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side due to conduction or radiation. A fire watch shall be required on the other side of the exposed wall, partition, ceiling or roof if there is any danger of the welding or cutting on one side to result in ignition of materials or structure on the unexposed side. Welding or cutting shall not be attempted on a metal partition wall or on partitions of combustible sandwich-type panel construction.

39.06 Fire Safety Requirements

(1) Cutting or welding operations shall be performed only in areas that have been protected against the ignition and spread of fire.

(2) Within the confines of an operating plant or structure cutting or welding shall be done in specific areas designed and approved for such work as a maintenance shop, an outside location or a detached structure which shall be of noncombustible or fire resistive construction.

NON-TEXT PAGE

39.06: continued

(3) When work cannot be moved as in most construction or structural modification activity, the area shall be made fire safe by removing all combustible material within a distance of 35 feet and all combustible material from beneath the location where welding or cutting is to be performed.

(4) When work cannot be relocated and combustible material cannot be feasibly relocated, all combustible material exposed within 35 feet horizontally or beneath the cutting or welding operation or within 35 feet of exposed floor, ceiling or wall openings shall meet the following requirements:

(a) Such combustible construction or material shall be protected from possible sparks, hot metal or oxide by fire resistive shields or noncombustible covers as required by the head of the fire department.

(b) Such floor, ceiling or wall openings shall be protected by fire resistive shields and openings or cracks in walls, floors or ducts shall be tightly covered to prevent the passage of sparks or slag to adjacent areas.

(5) At least one portable fire extinguisher having a rating of not less than 4-A:60-B:C shall be kept at the location where welding or cutting is done and at least one portable fire extinguisher having a rating of not less than 2-A:10-B:C shall be attached to all portable welding carts.

(6) Welding or cutting shall not be done in or near rooms or locations where flammable gases, liquids or vapors, lint, dust or loose combustible stocks are present when sparks or hot metal from the welding or cutting operations may cause ignition or explosion of such materials.

(7) Welding or cutting shall not be performed in the presence of explosive atmospheres or on containers, equipment, or in hollow spaces or cavities which contain or have contained flammable fluids, gases or solids until these containers or equipment have been thoroughly cleaned, inverted or purged. Upon request a certificate of completion or a receipt for services from a firm, company or corporation authorized in the removal and disposal of hazardous materials shall be presented to the head of the fire department at the time of application for permit.

(8) Sprinkler protection shall not be shut off while welding and cutting work is being performed. When welding or cutting is done close to automatic sprinkler heads, noncombustible board products or damp cloth guards shall be used to shield the individual heads, but shall be removed when the work is completed.

(9) Where a sprinkler system will be impaired or rendered inoperative for any reason, this shall be noted in the application for permit so that all necessary precautions may be taken as required by the head of the fire department.

(10) Hot tapping or other welding or cutting on a flammable gas or liquid transmission or distribution utility pipeline shall be performed only by persons specifically designated and qualified to perform such work.

39.07: Oxyfuel Gas Welding and Cutting

(1) Terminology.

(a) Oxygen shall be referred to by its proper name Oxygen and not by the word Air.

(b) Fuel gases shall be referred to by their proper names, such as acetylene, propane, natural gas, and not by the word Gas.

(2) Oxygen and Combustibles.

(a) Oxygen cylinders, cylinder valves, couplings, regulators, hoses, and apparatus shall be kept free from oily or greasy substances. Oxygen cylinders or apparatus shall not be handled with oily hands or gloves.

39.07: continued

(b) Oxygen shall not be used as a substitute for compressed air. Oxygen shall not be used in pneumatic tools, in oil preheating burners, to start internal combustion engines, to blow out pipelines, to dust clothing or work, or to create pressure for ventilation or similar applications. Jets of oxygen shall not be permitted to strike an oily surface, greasy clothing, or enter fuel oil or other storage tanks.
(c) Oxygen cylinders, equipment, pipelines, or apparatus shall not be used interchangeably with any other gas.

(3) Attachments for Gas Mixing. No device or attachment facilitating or permitting mixtures of air or oxygen with flammable gases prior to consumption, except at a burner or in a torch, shall be allowed unless approved for the purpose.

(4) Torches.
(a) Only approved torches shall be used.
(b) Connections shall be tested for gas tightness after assembly and before lighting the torch. Use soapy water or the equivalent, not a flame.
(c) Before lighting the torch for the first time each day, hoses shall be purged individually. This consists of allowing each gas to flow through its respective hose separately, long enough to purge out any flammable gas mixture in the hose. Hoses shall not be purged into confined spaces or near ignition sources.
(d) Used as a friction lighter, stationary pilot flame, or other suitable source of ignition. Do not use matches or cigarette lighters for lighting torches; do not attempt to light or relight torch from hot metal in a small cavity, hole, furnace, etc., where gas might accumulate. Point the torch away from persons or combustible materials.
(e) Manufacturers procedures shall be followed with respect to the sequence of operations in lighting, adjusting, and extinguishing torch flames.
(f) To minimize the possibility of gas accumulation in confined space due to leaks or improperly closed valves when gas welding or cutting is completed, the torch valves shall be closed and in addition, the fuel gas and oxygen supply to the torch shall be positively shut off at a point outside the confined area whenever the torch is not being used for a substantial period of time, such as during lunch or overnight. Where practicable, the torch and hose shall be removed from the confined space.

(5) Hose and Hose Connections.
(a) Hose for oxyfuel gas service shall comply with Specification IP-7 for Rubber Welding Hose, Compressed Gas Association and Rubber Manufacturers Association.
(b) Metal-clad or armored hose is not recommended. However, as part of a machine or an appliance when conditions of use make metal reinforcing advantageous, hose may be used in which such metal reinforcing is exposed to neither the inside gases nor the outdoor atmosphere.
(c) Hose shall be identified by exterior colors using red for fuel gas hose, green for oxygen hose, and black for inert-gas and air hose.
(d) When parallel lengths of oxygen and fuel gas hose are taped together for convenience and to prevent tangling, not more than four inches in each 12 inches shall be covered by tape.
(e) Hose showing leaks, burns, worn places, or other defects rendering it unfit for service shall be repaired or replaced.
(f) Hose connections shall comply with the standard hose connection specification, Compressed Gas Association pamphlet E-1
(g) Hose connections for welding gas lines shall not be compatible with connections for breathing air.
(i) When an approved device such as a hose check valve or flash-back arrestor is used in an oxyfuel gas welding and cutting torch system, the device shall be used and maintained in accordance with the manufacturer instructions.

39.07: continued

(6) Pressure-Reducing Regulators.

(a) Only approved pressure reducing regulators shall be used.

(b) Pressure reducing regulators shall be used only for the gas and pressures for which they are labeled. The regulator inlet connections shall comply with Compressed Gas Cylinder-Valve Outlet and Inlet Connections, Compressed Gas Association Standard V-1. Regulators shall not be interchanged among designated gas services.

(c) Union nuts and connections on regulators shall be inspected before use to detect faulty seats which may cause leakage when the regulators are attached to cylinder valves or hoses. Damaged nuts or connections shall be replaced.

(d) Gauges used for oxygen service shall be marked "USE NO OIL".

(e) Oxygen regulators shall be drained of oxygen before they are attached a cylinder or before the cylinder valve is opened (see also 527 CMR 39.07(10)(d) and (10)(k)). The regulator attached to a cylinder can be drained of oxygen by momentarily opening and then closing the downstream line to the atmosphere with the regulator adjusting screw engaged and the cylinder valve closed. The cylinder valve is then opened slowly. The oxygen cylinder connection shall be wiped clean with a clean cloth, free of oil and lint, and the cylinder valve "cracked" before connecting the regulator. Oxygen cylinder valves shall always be opened slowly.

(f) When regulators or parts of regulators, including gauges, need repair, the work shall be performed by persons who have been properly instructed.

(7) Cylinders (Containers).

(a) All portable cylinders used for storage and shipment of compressed gases shall be constructed and maintained in accordance with regulations of the U.S. Department of Transportation (DOT). Such compliance will be recognized by markings on the cylinder, usually on the top shoulder, with the applicable DOT specification number (ICC number on older cylinders) and by retest dates where applicable.

(b) No one except the owner of the cylinder or person authorized by the owner shall fill a cylinder.

(c) No person other than the gas supplier shall mix gases in a cylinder or transfer gases from one cylinder to another.

(d) Compressed gas cylinders shall be legibly marked with either the chemical or trade name of the gas in conformance with the Method for Marking Portable Compressed Gas Containers to Identify the Material Contained, ANSI Standard Z48.1, for the purpose of identifying the gas content. Such markings shall be by means of stenciling, stamping, or labeling, and shall not be readily removable. Do not use cylinders on which the labeling is missing or illegible. Return such cylinders to the supplier.

(e) The numbers and markings stamped into cylinders shall not changed except in conformance with DOT regulations.

(f) Compressed gas cylinders shall be equipped with connections complying with the Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections, ANSI/CGA V-1.

(g) All cylinders with a water weight capacity over 30 lb shall be equipped with a means of connecting a valve protection cap or with a collar or recess to protect the valve.

(h) The temperature of the cylinder contents shall not be allowed to exceed 130° F.

(8) Cylinder Storage.

(a) Cylinders shall be stored where they will not be exposed to physical damage, tampering by unauthorized persons, or subject to temperatures which would raise the contents above 130° F.

(b) Cylinders shall be stored away from elevators, stairs, or gangways in assigned places where cylinders will not be knocked over or damaged by passing or falling objects. Cylinders shall be secured in storage to prevent falling.

(c) Cylinders in storage shall be separated from flammable and combustible liquids, and from easily ignited materials such as wood, paper, packaging materials, oil, and grease by at least 20 ft. or by a noncombustible barrier at least five feet high having a fire resistance of at lease ½ hour.

(d) Oxygen cylinders in storage shall be separated from fuel gas cylinders by a similar distance or barrier as described in 527 CMR 39.07(8)(c).

39.07: continued

(e) Acetylene and liquefied gas cylinders shall be stored and used valve end up.

(f) Fuel gas storage limits shall be in accordance with the provisions of 527 CMR 6.00 and 527 CMR 14.00, as required.

(9) Cylinder Handling.

(a) Cylinders shall not be dropped, struck, or permitted to strike objects violently in a manner which may damage the cylinder, valve, or safety device.

(b) Bars shall not be used under valves or valve-protection caps to pry cylinders loose when frozen to the ground or otherwise fixed. The use of warm (not boiling) water is recommended.

(c) Cylinders shall not be used as rollers or supports, whether full or empty.

(d) Safety devices shall not be tampered with.

(e) Cylinder valves shall be closed before moving cylinders.

(f) Valve protection caps, where the cylinder is designed to accept a cap, shall always be in place and hand tight except when cylinders are in use or connected for use.

(g) Valve protection caps shall not be used for lifting cylinders.

(h) When transporting cylinders by a crane or derrick, a cradle or suitable platform shall be used. Slings or electromagnets shall not be used for this purpose.

(i) When cylinders are transported by motor vehicle, they shall be secured in position.

(j) When cylinders are to be moved with regulators attached, the cylinder shall be secured in position when moved, and cylinder valve closed.

(10) Cylinder Use.

(a) Compressed gas shall not be used from cylinders without reducing the pressure through a suitable regulator attached to the cylinder valve unless the equipment used is designed to withstand full cylinder pressure.

(b) Acetylene shall not be used at a pressure in excess of 15 psig or 30 psia. The 30 psia limit is intended to prevent unsafe use of acetylene in pressurized chambers such as caissons, underground excavations, or tunnel construction. 527 CMR 39.07(10)(b) shall not apply to storage of acetylene dissolved in a suitable solvent in cylinders manufactured and maintained according to DOT requirements.

(c) Before connecting a regulator to a cylinder valve, the valve outlet shall be wiped clean with a clean cloth free of oil and lint, and the valve shall be opened momentarily and closed immediately. This action, generally termed "cracking" is intended to clear the valve of dust or dirt that otherwise might enter the regulator. The valve shall be "cracked" while standing to one side of the outlet, not in front of it. A fuel gas cylinder valve shall not be "cracked" near other welding or cutting work or near sparks, flame, or other possible sources of ignition.

(d) The following shall be done after the regulator is attached to oxygen cylinders:

1. Engage the adjusting screw and open the downstream line to drain the regulator of gas.

2. Disengage the adjusting screw and open the cylinder valve slightly so that the regulator cylinder-pressure gauge pointed moves up slowly before opening the valve all the way. Stand to one side of the regulator and not in front of the gauge faces when opening the cylinder valve. If oxygen high pressure is suddenly applied, it is possible to cause ignition in the regulator and injure the operator.

(e) A hammer or wrench shall not be used to open the cylinder valves that are fitted with hand wheels.

(f) Cylinders not having fixed hand wheels shall have keys, handles, or nonadjustable wrenches on valve stems while these cylinders are in service so that the gas flow can be turned off quickly in case of emergency.

(g) When a high-pressure (nonliquefied) gas cylinder is un use, the valve shall be opened fully in order to prevent leakage around the valve stem.

(h) An acetylene cylinder valve shall not be opened more than approximately 1½ turns and preferably no more than ¼ of a turn. This is so that it may be closed quickly in case of emergency.

(i) Nothing shall be placed on top of a cylinder when in use which may damage the safety device or interfere with the quick closing of the valve.

(j) Cylinder valves shall be closed when work is finished.

39.07: continued

(k) Before a regulator is removed from a cylinder, the cylinder valve shall be closed and the gas released from the regulator.
(l) A suitable cylinder truck, chain, or steadying device shall be used to keep cylinders from being knocked over while in use.
(m) Cylinders shall be kept far enough away from actual welding or cutting operations so that sparks, hot slag, or flame will not reach them, otherwise fire resistive shields shall be provided.
(n) Cylinders shall not be placed where they might become part of an electrical circuit. Contacts with third rails, trolley wires, etc., shall be avoided. Cylinders shall be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits such as for arc welding machines. The tapping of electrodes against a cylinder shall be prohibited. Do not strike an arc on cylinders.

(11) Cylinder Emergencies.
(a) If a leak is found around the valve stem of a fuel gas cylinder, the packing nut shall be tightened, or the cylinder valve closed.
(b) If tightening the packing nut does not stop a valve stem leak, or if a fuel gas valve is leaking at the seal and cannot be stopped by closing the valve firmly, or if a leak should develop at a cylinder fuse plug or other safety device, then the fuel gas cylinder shall be moved to a safe location outdoors away from any source of ignition, marked properly, and the supplier advised. A warning sign shall be posted not to approach the cylinder with a lighted cigarette or source of ignition. The cylinder valve may be opened slightly to gradually discharge the contents.
(c) Small fires at fuel gas cylinders, usually resulting from ignition of leaks, shall be extinguished, if possible, by closing the cylinder valve or by the use of water, wet cloths, or fire extinguisher. The leaks shall then be treated as described in 527 CMR 39.07(11)(a) and (11)(b).
(d) In the case of a large fire at a fuel gas cylinder, such as from the functioning of a fuse plug or safety device, persons shall be evacuated from the area, and the cylinder kept wet down with a heavy water stream to keep it cool. It is usually better to allow the fire to continue to burn and consume the escaping gas, otherwise it may reignite with explosive violence. If circumstances permit, it is often better to allow the cylinder fire to burn out in place rather than attempt to move the cylinder. If the cylinder is located where the fire should not be allowed to burn out in place, attempts may be made to made to move it to a safer location, preferably outdoors. Personnel shall remain as distant as possible, and the cylinder shall be kept cool with a water stream.

39.08: Electric Arc Welding and Cutting

(1) The frame or case of electric arc welding or cutting machines, except internal combustion engine driven machines, shall be grounded in accordance with the requirements of 527 CMR 12.00, the Massachusetts Electrical Code.

(2) Welding current return circuits from the work to the machine shall have proper electrical contact at all joints and periodic inspection shall be made to ascertain that proper electrical contact is maintained.

(3) Written rules and instruction covering the safe operation of equipment shall be made available to the welder and shall be strictly followed.

(4) When electric arc welding or cutting is to be discontinued for one hour or more, such as during lunch hour or overnight, all electrodes shall be removed from the holders, the holders shall be carefully located so that accidental contact cannot occur, and the machine shall be disconnected from the power source.

(5) Maintenance
(a) All arc welding equipment shall be maintained in safe working order at all times. The welder or maintenance personnel shall report any equipment defect or safety hazard to be supervisor, and the use of such equipment shall be discontinued until its safety has been assured. Repairs shall be made by qualified personnel only.

39.08: continued

(b) Welding equipment shall be maintained in good mechanical and electrical condition to avoid unnecessary hazards. Commutators shall be kept clean to prevent excessive flashing.
(c) Rectifier welders shall be inspected frequently to detect accumulations of dust or lint that would interfere with ventilation. Electrical coil ventilation ducts shall be similarly inspected and cleaned. It is good practice to blow out the entire welding machine with clean, dry compressed air using adequate safety precautions.
(d) Fuel systems on engine-driven machines shall be inspected and checked for possible leaks and accumulations of water that might cause rusting. Rotating and moving components shall be kept properly shielded and lubricated.
(e) Welding equipment used in the open shall be protected from inclement weather conditions. Protective covers shall not obstruct the ventilation necessary to prevent overheating of the machine.
(f) Air filters in the ventilating system of the electrical components are not recommended, unless provided by the manufacturer of the welding machine. The reduction of air flow resulting from the use of an air filter on equipment not so designed can subject internal components to an overheating condition and subsequent failure.
(g) Machines which have become wet shall be thoroughly dried and properly tested before being used. When not in use, the equipment shall be stored in a clean, dry place.
(h) Welding cable shall be inspected for wear or damage. Cables with damaged insulation or connectors shall be replaced or repaired to achieve the mechanical strength, insulating quality, electrical conductivity, and watertightness of the original cable. Joining lengths of cables shall be done by means specifically intended for the purpose. The connection means shall have insulation adequate for service conditions.
(i) Use of compressed gases for shielding arc welding operation shall be in accordance with the applicable provisions of 527 CMR 39.06 and 39.07.

(6) Resistance Welding.
(a) All resistance welding equipment shall be selected for safe application to the work intended. The personnel safety aspects of resistance welding shall be given consideration when choosing equipment for the work to be performed.
(b) Workers designated to operate resistance welding equipment shall have been properly instructed and judged competent to operate such equipment.
(c) All resistance welding equipment and operations shall be in conformance with the provisions of 527 CMR 12.00 the Massachusetts Electrical Code. The equipment shall be installed by qualified personnel in accordance with the manufacturer's instructions.

39.09: Referenced Publications

Documents or portions thereof that are referenced within 527 CMR 39.00 shall be considered a part of the requirements of 527 CMR 39.00. Refer to 527 CMR 49.00 for a complete listing of all documents referenced in 527 CMR.

REGULATORY AUTHORITY

527 CMR 39.00: M.G.L. c. 22, § 14; c. 148, § 10.

(527 CMR 40.00 through 48.00: RESERVED)

(PAGES 273 THROUGH 286 ARE RESERVED FOR FUTURE USE.)

527 CMR 49.00: APPENDICES

Section

49.01: Appendix A
49.02: Appendix B
49.03: Appendix C

49.01: Appendix A

REFERENCED STANDARDS

Part I

The following is a listing of the standards referenced in 527 CMR, the effective date of the standard, the promulgating agency of the standard and the section(s) of 527 CMR that refer to the standard. Where the date of the standard indicated below is different than that indicated in other sections of 527 CMR, the date that appears in the other sections of 527 CMR shall take precedence.

AGA

American Gas Association
1515 Wilson Boulevard
Arlington, Virginia 22209
(703) 841-8400

Standard Reference Number	Title	Referenced in 527 CMR Section Number
		6.04

ANSI

American National Standards Institute
11 West 42nd Street
New York, New York 10036
(212) 642-4900

Standard Reference Number	Title	Referenced in 527 CMR Section Number
		2.06(2)
B16.5 - 88	Pipe Flanges and Flange Fittings	15.04(11)
B16.24 - 91	Cast Copper Alloy Pipe Flanges and Flange Fittings	15.04(11)
B31.3 - 93	Chemical Plant and Petroleum Refinery Piping	15.05(3)
CGA-V-1 - 87	Compressed Gas Cylinder Valve Outlet and Inlet Connections	39.07(7)(f)
K61.1 - 89	Safety Requirements for the Storage and Handling of Anhydrous Ammonia	14.03(13)(a), 14.03(13)(c)
Z49.1-88	Safety in Welding and Cutting	39.03
Z358.1 - 90	Emergency Eyewash and Shower Equipment	10.02(2)

49.01: continued

API

American Petroleum Institute
1220 L Street, NW
Washington, DC 20005
(202) 682-8378

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
		6.04(2), 26.04
1631 - 92	Interior Lining of Underground Storage Tanks	9.07(I)(4)
1632 - 87	Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems	9.02
	Code for Unfired Pressure Vessels for Petroleum Liquids and Gases	9.02, 9.07(G)
2009-88	Safe Welding and Cutting Practices in Refineries, Gasoline Plants and Petrochemical Plants	39.03

ASA

American Standards Association (Now ANSI)
11 West 42nd Street
New York, New York 10036
(212) 642-4900

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
B31.1 - 92	Power Piping	9.03(G)(2)

ASME

American Society of Mechanical Engineers
22 Law Drive
Fairfield, NJ 07007
(201) 882-1170

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
		6.03, 26.03, 26.04
Section VIII - 95	Boiler and Pressure Vessel Code	6.07(4)(a), 7.04(a)(2), 7.04(a)(3), 8.07(2), 9.02, 9.07(G), 26.03

49.01: continued

ASTM

American Society for Testing Materials
1916 Race Street
Philadelphia, Pennsylvania 19103-1187
(215) 299-5400

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
A395 - 88(93)E1	Ferric Ductile Iron Pressure Retaining Castings for Use at Elevated Temperatures	15.05(3)
D56 - 93	Test Method for Flash Point by Tag Closed Cup Tester	14.02, 15.02
D86 - 95	Standard Method of Test for Distillation of Petroleum Products	14.02
D93 - 94	Test Methods for Flash Point by Pensky-Martens Closed Cup Tester	14.02, 15.02
D323 - 94	Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method)	14.02, 35.02
D396 - 90	Specification for Fuel Oils	4.02, 9.02
E136 - 94A	Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C	39.03
E1537-93	Standard Test Method for Fire Testing of Real Scale Upholstered Furniture Items	29.03

ATF

Alcohol, Tobacco, and Firearms
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402-9325
(202) 512-1800

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
		13.05 (Table 2), 1305(5)(b)
	Explosives and Blasting Procedures Manual	13.13
Pub. #5400.7 - 92	Ammunition and Explosives Safety Board	13.13
Title 27, Parts 55, 181	Explosive Materials	13.03, 13.04(5) 13.04(10)(a), 13.10(1), 13.13

AWS

American Welding Society
550 N.W., 42nd Avenue
Miami, FL 33126
(305)443-9353

Standard Reference Number (- year)	Title	Referenced in 527 Section Number
AWS Z49.1 - 88	Safety in Welding and Cutting	39.03

49.01: continued

BM

U.S. Bureau of Mines
810 7th Street N.W.
Washington, DC 20241
(202) 501-9650

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
	Information Circular	13.13
R18507 - 80	Partical Velocity v. Frequency	13.09 (Figure a & b)

BOCA

Building Official & Code Administrators International, Inc.
4051 West Flossmoor Road
Country Club Hills, Illinois 60478-5795
(708) 799-2300

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
BNMC - 96	BOCA National Mechanical Code	5.03(9)(b), 10.14(1)(b), 10.14(3), 10.21(3), 10.21(4), 35.04(4)(d), 37.03(8)
BNFPC - 96	BOCA National Fire Prevention Code	39.03

CBHF

California Department of Consumer Affairs
Bureau of Home Furnishings and Thermal Insulation
3485 Orange Grove Avenue
North Highlands, California 95660-5595
(916) 574-2040

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
Tech. Bulletin 117 - 80	Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture	10.08(2), 29.03(4), 29.03(5)
Tech. Bulletin 133 - 91	Flammability Test Procedure for Seating Furniture for Use in Public Occupancies	29.03(1), 29.03(2), 29.03(4)

49.01: continued

CFR

Code of Federal Regulations
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
(202) 512-1800

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
	Federal Resource Conservation and Recovery Act	9.02, 9.07(N)(1)
	Federal Comprehensive Environmental Response, Compensation and Liability Act of 1980	9.02
	Clean Water Act	9.07(N)(3)
	Natural Gas Pipeline Safety Act of 1968	9.07(N)(12)
	United Nations (UN) Hazardous Material Identification	8.05(1), 8.05(3)(b)
Title 29, Part 1910.225 Subpart Q	Welding, Cutting and Brazing	39.03
Title 33, Parts 126 and 154	Navigation and Navigable Waterways	13.05(4), 15.01(2)(c), 15.01(2)(d), 15.01(2)(e)
Title 40, Parts 261 and 302	Protection of Environment	9.02
Title 40, Parts 280 and 281	Protection of Environment (UST's)	9.05(G)(4)(d), 9.07(N)
Title 46	U.S. Coast Guard Standards	2.08(10)
Title 46, Parts 30 - 40	Shipping	15.01(2)(d), 15.07(4)
Title 49	Transportation	8.01(1), 8.01(2), 14.03(13)(a), 14.03(13)(b)
Title 49, Parts 172 Supbart F	Blasting agents	13.05(2)(e)
Title 49, Parts 174.16, 100-179	Hazardous Materials	13.03, 13.06, 13.06(1)(h), 13.06(3), 13.11(2), 13.11(3), 13.11(5), 13.13
Title 49, Parts 191-193	Pipeline Safety	39.04
Title 49, Parts 387-397	Federal Motor Carrier Safety	13.06(1)(a)

49.01: continued

CGA

Compressed Gas Association
1725 Jefferson Davis Highway
Suite No. 1004
Arlington, Virgina 22202
(703) 412-0900 (ext. 799)

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
E-1 - 94	Standard Connections for Regulator Outlets, Torches and Fitted Hose for Welding and Cutting Equipment	26.04 39.07(5)(f)
SB-11 - 87	Use of Rubber Welding Hose	39.07(5)(a)
V-1 - 94	Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections	39.07(6)(b), 39.07(7)(f)

CSA

Canadian Standards Association
55 Scarsdale Road
Don Mills, Ontario, Canada M3B 2R3

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
B51 - 95	Boiler, Pressure Vessel and Pressure Piping Code	26.03

DOD

U.S. Department of Defense
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402-9325
(202) 512-1800

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
DOD 6055.9STD	Ammunition and Explosives Safety Board	13.01(2) 13.13

49.01: continued

DOT

U.S. Department of Transportation
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402-9325
(202) 512-1800

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
CFR Title 49	Transportation	2.04(1), 2.04(2), 2.04(5), 6.03, 6.07(2)(a), 6.07(3), 6.07(6)(h), 8.02(1), 8.07(4), 13.01(2), 13.03, 13.05 (Table 2), 13.06(1)(h), 13.06(3), 13.08(2), 13.09(1)(c), 13.11(1), 13.11(5), 14.04(9), 14.04(10), 15.02, 26.03, 35.04(2)(b), 39.07(7)(a), 39.07(7)(e), 39.07(10)(b)
Pub. No. FHWA-HI-92-001 - 91	FHA National Highway Institute Course No. 13211	13.13

EPA

U.S. Environmental Protection Agency
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402-9325
(202) 512-1800

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
CFR Title 40	Protection of Environment	9.05(D)(4), 37.01(2)

FM

Factory Mutual Engineering Corporation
1151 Boston Providence Turnpike
Norwood, Massachusetts 02062
(617) 255-4621

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
		6.04, 26.04
Class Nos. 6051 and 6052 - 76	Safety Containers and Filling, Supply and Disposal Container	15.02, 5.10(1)
Loss Prevention Data Sheet 7-85 - 91	Metals and Alloys	14.03(14)(e)
Publication P9104	Hot Work Policy, Precautions and Permission	39.03

49.01: continued

ICC

Interstate Commerce Commission (Now DOT)
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402-9325
(202) 512-1800

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
CFR Title 49	Transportation......................................	6.04, 26.04, 39.07(7)(a)

IME

Institute of Makers of Explosives

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
		13.03
Pub. #1 - 93	Construction Guide for Storage Magazines	13.13
Pub. #2 - 91	The American Table of Distances	13.05(3)(a), 13.05 (Tables 1 & 2), 13.05(5)(b), 13.13
Pub. # 3 - 85	Suggested Code of Regulations for the Manufacture, Transportation, Storage, Sale, Possession, and Use of Explosive Materials	13.13
Pub. #12 - 91	Glossary of Commercial Explosives Industry Terms	13.13
Pub. #17 - 87	Safety in the Transportation, Storage, Handling, and Use of Explosive Materials	13.13
Pub. #20 -	Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Commercial Electric Detonators (Blasting Caps)	13.09(1)(p)2.
Pub. #22 - 93	Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials .	13.06(1)(h), 13.13

49.01: continued

NACE

National Association of Corrosion Engineers
P.O. Box 218340
Houston, Texas 77218-8340
(713) 492-0535

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
		9.02
RP0169 - 92	Control of External Corrosion on Underground or Submerged Metallic Piping Systems	9.05(E)(2)

NEMA

National Electrical Manufacturers Association
2101 L Street N.W.
Washington D.C. 20037
(202) 457-8400

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
	(No Specific Standard Referenced)	12.00 (210-8(a)(3))

NFPA

National Fire Protection Association
Batterymarch Park
Quincy, Massachusetts 02269
(617) 770-3000

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
10 - 98	The Standard for Portable Fire Extinguishers	8.15, 10.02(1), 15.02
12 - 93	Carbon Dioxide Extinguishing Systems	3.08(10)
14 - 93	Installation of Standpipe and Hose Systems	15.09(5)
17 - 94	Dry Chemical Extinguishing Systems	9.06(B)(1)(g)
30 - 93	Flammable and Combustible Liquids Code	14.03(22), 14.03(25)(e), 14.03(26), 15.09(9)
30A - 93	Automotive and Marine Service Station Code	15.09(9)
32 - 90	Drycleaning Plants	3.03(1)(b), 3.15(1)
40 - 94	Storage and Handling of Cellulose Nitrate Motion Picture Film	7.01, 10.27
43D - 94	Storage of Pesticides in Portable Containers	37.03(10)
50A - 94	Gaseous Hydrogen Systems at Consumer Sites	14.03(13)(e)
51B - 94	Fire Prevention in Use of Cutting and Welding Processes	39.03
52 - 95	Standard for Compressed Natural Gas (CNG) - Vehicular Fuel Systems	26.02(2), 26.04, 26.07(1), 26.07(3), 26.07(5)
54 - 92	National Fuel Gas Code	10.03(7)
58 - 98	Liquefied Petroleum Gas Code	6.02(2)(c), 6.05(7), 6.07(1), 6.07(3), 6.07(4), 6.07(5)

49.01: continued

61 - 95	Fires and Dust Explosions in Agricultural and Food Products Facilities	10.16(1)(a)
65 - 93	Processing and Finishing Aluminum	10.16(1)(a)
68 - 94	Venting of Deflagrations	10.16(1)(a)
69 - 92	Explosion Prevention Systems	10.16(1)(a)
70 - 96	National Electrical Code	12.00
72- 98	National Fire Alarm Code	24.07(3)(d)
82 - 94	Incinerators, Waste and Linen Handling Systems and Equipment	34.07(1)
85F (Now 8503 - 92)	Pulverized Fuel Systems	10.16(1)(a)
86 - 95	Ovens and Furnaces Design, Location and Equipment	10.19(3)(a)
86C - 95	Industrial Furnaces Using a Special Processing Atmosphere	10.19(3)(a)
86D - 95	Industrial Furnaces Using a Vacuum as an Atmosphere	10.19(3)(a)
90A - 93	Standard for the Installation of Air Conditioning and Ventilating Systems	4.04(5)(o)6.
90B - 93	Standard for the Installation of Warm Air Heating and Air Conditioning Systems	4.04(5)(o)6.
91 - 95	Installation of Exhaust Systems for Air Conveying of Materials	3.04(11), 9.04(6)(c), 10.16(1)(a), 18.01(6)
96 - 98	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations	10.03(8)
101 - 94	Life Safety Code	10.03(6)
211 - 92	Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances	10.03(7)
329 - 92	Handling Underground Releases of Flammable and Combustible Liquids	9.05(5)(c)
480 - 93	Storage, Handling and Processing of Magnesium	14.03(14)(a)
481 - 95	Production, Processing , Handling and Storage of Titanium	14.03(14)(b)
482 - 87	Production, Processing, Handling and Storage of Zirconium	14.03(14)(c)
490 - 93	Storage of Ammonium Nitrate	10.16(1)(a)
495 - 92	Explosive Material Code	13.13
505-98	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance and Operation	
651 - 93	Manufacture of Aluminum and Magnesium Powder	10.16(1)(a), 14.03(14)(d)
653 (Now 120 - 94)	Coal Preparation Plants	10.16(1)(a)
654 - 94	Prevention of Fire and Dust Explosions in the Chemical, Dye, Pharmaceutical, and Plastics Industries	10.16(1)(a), 7.00
655 - 93	Sulfur Fires and Explosions	10.16(1)(a)
701 - 96	Flame-Resistant Textiles and Films	19.03(1), 19.03(2), 19.03(3), 19.03(4), 21.04(1), 21.04 (Tab.1 and 2)
1122 - 94	Code for Model Rocketry	16.01, 16.02
1123 - 95	Outdoor Display of Fireworks	2.06(2)

PEI

Petroleum Equipment Institute
P.O. Box 2380
Tulsa, Oklahoma 74101
(918) 494-9696

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
RP200 - 92	Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling	9.04(A)(1)

RMA

Rubber Manufacturer Association
1400 K Street N.W.
Suite 900
Washington D.C. 20005
(202) 682-4800

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
IP-7 -	Rubber Welding Hose	39.07(5)(a)

UL

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, Illinois 60062
(708) 272-8800

Standard Reference Number (- year)	Title	Referenced in 527 CMR Section Number
		6.04, 9.02, 26.04
30 - 91	Standard for Metal Safety Cans	5.10(1), 15.02
80 - 80	Steel Inside Tanks for Oil Burner Fuel	4.03(5)(b), 4.03(8)(b)
142 - 93	Steel Aboveground Tanks for Flammable and Combustible Liquids	4.03(5)(c), 4.03(8)(b), 9.03(F), 9.04(A)(2)
268 - 89	Smoke Detectors for Fire Protective Signaling Systems	24.06(1)(b)
2085 - 94	Insulated Aboveground Tanks for Flammable and Combustible Liquids	9.04(D)(1)

49.01: continued

REFERENCED STANDARDS
Part II

The following is a listing of recognized standards not specifically listed in 527 CMR. This listing is provided for informational purposes only and is not intended to represent a complete list of recognized standards.

API

American Petroleum Institute
1220 L Street, NW
Washington, DC 20005
(202) 682-8378

Standard Reference Number (- year)	Title
1621 - 93	Bulk Liquid Stock Control at Retail Outlets

NFPA

National Fire Protection Association
Batterymarch Park
Quincy, Massachusetts 02269
(617) 770-3000

Standard Reference Number (- year)	Title
11 - 94	Low Expansion Foam and Combined Agent Systems
11A - 94	Medium and High Expansion Foam Systems
13 - 94	Installation of Sprinkler Systems
13D - 94	Sprinkler Systems in One- and Two- Family Dwellings and Mobile Homes
13R - 94	Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height
16 - 91	Deluge Foam-Water Sprinkler and Spray Systems
17A - 90	Wet Chemical Extinguishing Systems
20 - 93	Installation of Centrifugal Fire Pumps
22 - 96	Water Tanks for Private Fire Protection
24 - 95	Installation of Private Fire Service Mains
25 - 95	Inspection, Testing and Maintenance of Water-Based Fire Protection Systems
33 - 95	Spray Application Using Flammable and Combustible Liquids
34 - 95	Dipping and Coating Processes Using Flammable and Combustible Liquids
35 - 95	Manufacture of Organic Coatings
36 - 93	Solvent Extrication Plants
37 - 94	Combustion Engines and Gas Turbines
50 - 96	Bulk Oxygen Systems at Consumer Sites
51 - 92	Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes
99 - 93	Health Care Facilities
704 - 90	Identification of the Fire Hazards of Materials
8503 - 92	Pulverized Fuel Systems

49.02: Appendix B

MASSACHUSETTS RULES AND REGULATIONS OTHER THAN 527 CMR

Specific numbers have been established by the Massachusetts Office of the Secretary of the Commonwealth to identify for reference purposes all rules and regulations promulgated by agencies of the Commonwealth of Massachusetts. These numbers are designated as "Code of Massachusetts Regulations" (CMR's).

The following is a listing of CMR's referenced in 527 CMR, the promulgating agency of the CMR and the section(s) of 527 CMR that refer to the CMR.

DPH

Department of Public Health
150 Tremont Street, 10th floor
Boston, MA 02111
(617) 727-2700

Standard Reference Number (- year)	Title	Referenced Section in 527 CMR
105 CMR	Department of Public Health	1.06(6)
105 CMR	Water Resource Commission Pamphlet Number 6672	18.01(8)

DPS

Department of Public Safety
1 Ashburton Place, Rm. 1301
Boston, MA 02108
(617) 727-3200

Standard Reference Number (- year)	Title	Referenced Section in 527 CMR
248 CMR	Uniform State Plumbing Code and Massachusetts Fuel Gas Code	4.04(3)(c), 5.07(3), 10.02(2), 10.14(1)(b), 35.04(4)(b)
454 CMR 10.00	Construction Industry Rules and Regulations Part 17, Tunnels and Shafts, Caissons, Cofferdams and Compressed Air	12.00 (Apx. A)
502 CMR 3.00	Provisions for Approving Underground Steel Storage Tank Dismantling Yards	9.07(k)(2)
520 CMR 12.00	Installation of Tanks Containing Fluids Other Than Water in Excess of 10,000 Gallons Capacity	6.08(1)(b),9.01, 9.02
521 CMR	Architectural Access Board	12.00 (Apx. A)
524 CMR	Massachusetts Elevator Code	12.00 (Apx. A), 10.14(2)
780 CMR	State Board of Building Regulations and Standards	1.02,1.06, 2.09, 4.02, 4.03(1)(a), 4.03(6)(b), 4.03(7)(a), 4.04(5)(o)(6), 4.04(9)(b)(1), 5.02, 5.03, 5.07, 9.06, 10.03, 10.07, 10.13, 10.14, 10.15, 10.17, 10.21, 12.00, 13.11(3)(f), 13.11(4)(h), 14.03(17), 14.03(25), 18.01(2), 23.02(2)(c), 28.03(2)(b), 28.03(2)(c), 29.01, 29.03(4), 34.06(4), 35.04, 37.03(8)
Division of Inspection		8.02, 9.02, 9.05(E)(1)(g), 9.07(J)(5), 9.07(J)(6), 9.07(J)(7), 15.02

49.02: continued

DEP

Department of Environmental Protection
One Winter Street
Boston, MA 02108
(617) 292-5500

Standard Reference Number (- year)	Title	Referenced Section in 527 CMR
		5.09(2), 9.02, 9.05(E)(1)(e), 9.05(E)(1)(f), 9.07(B)(6), 9.07(H)(1)(b), 9.07(H)(4), 9.07(H)(5), 9.07(H)(6), 9.07(J)(1), 9.07(K)(4), 10.01, 10.12(4)(b), 10.22(2), 10.22(3), 34.04, 37.01(2)
310 CMR 7.00	Air Pollution Control................................	9.05(G)(2)
310 CMR 19.00	Solid Waste Management.........................	19.03(1)
310 CMR 22.00	Drinking Water...	9.02
310 CMR 30.00	Hazardous Waste Regulations..................	9.05(D), 9.07(J)(2), 9.07(J)(3), 9.07(J)(2), 9.07(J)(3), 18.01(8)
310 CMR 40.00	Massachusetts Contingency Plan.............	9.02, 9.05(E)(1)(g), 9.07(H)(6), 9.07(J)(1)

DPU

Department of Public Utilities
100 Cambridge Street, 12th Floor
Boston, MA 02202
(617) 727-3500

Standard Reference Number (- year)	Title	Referenced Section in 527 CMR
220 CMR 100-112	Gas Distribution Code	39.04(1)(c)

DSP

Department of State Police
470 Worcester Road
Framingham, MA 01701
(508) 820-2300

Standard Reference Number (- year)	Title	Referenced Section in 527 CMR
		8.02(1)

EOAF

Executive Office of Administration and Finance
State House, Room 373
Boston, MA 02133
(617) 727-2040

Standard Reference Number (- year)	Title	Referenced Section in 527 CMR
801 CMR		50.06(2)

49.03: Appendix C

DEFINITION AND REQUIREMENTS FOR A NATIONALLY RECOGNIZED TESTING LABORATORY

(1) Application. 527 CMR 49.03 shall apply only when the term "nationally recognized testing laboratory" is used in other sections of 527 CMR.

(2) Laboratory requirements. The term "*nationally recognized testing laboratory*" (NRTL) means an organization which tests for safety, and lists or labels or accepts, equipment or materials and which meets all of the following criteria:

(a) For each specified item of equipment or material to be listed, labeled or accepted, the NRTL has the capability (including proper testing equipment and facilities, trained staff, written testing procedures, and calibration and quality control programs) to perform:

1. Testing and examining of equipment and materials for safety purposes to determine conformance with appropriate test standards; or
2. Experimental testing and examining of equipment and materials for safety purposes to determine conformance with appropriate test standards or performance in a specified manner.

(b) The NRTL shall provide, to the extent needed for the particular equipment or materials listed, labeled, or accepted, the following controls or services:

1. Implements of control procedures for identifying the listed and labeled equipment or materials;
2. Inspects the run of production of such items at factories for product evaluation purposes to assure conformance with the test standards: and
3. Conducts field inspections to monitor and to assure the proper use of its identifying mark or labels on products;

(c) The NRTL is completely independent of employers subject to the tested equipment requirements, and of any manufacturers or vendors of equipment or materials being tested for these purposes: and,

(d) The NRTL maintains effective procedures for:

1. Producing creditable findings or reports that are objective and without bias; and
2. Handling complaints and disputes under a fair and reasonable system.

(3) Test standards. An "*appropriate test standard*" referred to in 527 CMR 49.03(2)(a)1. and 2. is a document which specifies the safety requirements for specific equipment or class of equipment and is:

(a) Recognized in the United States as a safety standard providing an adequate level of safety, and

(b) Compatible with and maintained current with periodic revisions of applicable national codes and installation standards, and

(c) Developed by a standards developing organization under a method providing for input and consideration of views of industry groups, experts, users, consumers, governmental authorities, and others having broad experience in the safety field involved, or

(d) In lieu of 527 CMR 49.03(3)(a), (b), and (c), the standard is currently designated as an American National Standards Institute (ANSI) safety designated product standard or an American Society for Testing and Materials (ASTM) test standard used for evaluation of products or materials.

(4) Alternative test standard. If a testing laboratory desires to use a test standard other than one allowed under 527 CMR 49.03(3), then the State Fire Marshal shall evaluate the proposed standard to determine that it provides an adequate level of safety before it is used.

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527 CMR 50.00: PETITIONS FOR ADOPTION, AMENDMENT OR REPEAL OF REGULATIONS

Section

50.01: Scope and Purpose
50.02: Petitions for the Adoption, Amendment or Repeal of Regulations
50.03: Procedures to Handle Petitions for the Adoption, Amendment or Repeal of Regulations

50.01: Scope and Purpose

527 CMR 50.00 is adopted by the Board of Fire Prevention Regulations pursuant to MGL c. 30A, § 4 and prescribes the procedures for the submission, consideration and disposition of petitions of interested persons for the adoption, amendment or repeal of regulations.

50.02: Petitions for the Adoption, Amendment or Repeal of Regulations

Any interested person may, at any time, petition the Board to adopt, amend or repeal any regulation. The petition shall be addressed to the Board in care of the Chairperson. Said petition may be sent by mail or delivered to the following address: Board of Fire Prevention Regulations, P.O. Box 1025, State Road, Stow, MA 01775. All petitions shall be signed by the petitioner or the petitioner's designee, and shall set forth clearly and concisely the text of the proposed regulation. The petition may be accompanied by any supporting data, views or arguments.

50.03: Procedures to Handle Petitions for the Adoption, Amendment or Repeal of Regulations

Upon receipt of a petition for the adoption, amendment or repeal of a regulation the Board shall review the petition within 60 days of receipt thereof and determine if further review or action relative to the petition is warranted.

REGULATORY AUTHORITY

527 CMR 50.00: M.G.L. c. 148, §§ 10 and 28; c. 22, § 14.

NON-TEXT PAGE